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INSECTS INJURIOUS TO DRUGS.

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From an Inaugural Essay presented to the Philadelphia College of Pharmacy.

In this paper is given simply what has been noted by the writer during a study of these insects extending over more than a year.

Sirodrepa panicea.—This is the elliptical, reddish-brown beetle, about one-eighth of an inch long, which is found in almost every edible drug, and in some, such as aconite root and capsicum, that would be pronounced far from edible. In addition to these two drugs, I have found it in bitter almonds, sweet almonds, angelica, boneset, calumba, chamomile, chocolate, coriander, dandelion, elm bark, ergot, extract of licorice, German chamomile, orris root, prince's pine, rhubarb, squill, and sweet flag.

The larva is white, with a brown head, is about twice as long as the beetle when full grown, although it is seldom or never seen stretched out at full length, always remaining curled up in a ball. It will in time fairly honeycomb a piece of root with small holes about one-twenty-fifth of an inch in diameter, at the end of which it is generally to be seen at home. Under the influence of camphor, these larvæ become uneasy, but being apparently unable to crawl away, resign themselves to their fate, and seem to thrive just as well with camphor as without it.

Calandra remotopunctata.—This is a small, black beetle, about the size of the last, with what is popularly termed a "snout," projecting from the front of the head downwards. Under the microscope the back, thorax, and head are seen to be finely pitted, giving the insect a rough appearance. It was found in large numbers, the larva feeding on pearl barley, inside of which it lives, the egg being probably laid in the grain by the parent, and on hatching, the little insect makes its home there, eating all but the shell, and sometimes attacking the grain from the outside.

Tenebrioides mauritanica, a species of "meal-worm," was found in pearl barley, and one specimen in calumba. It is a dark brown beetle, five-sixteenths of an inch long, the head and thorax forming nearly half the total length, and the mouth being fringed with hair. The back, which at first sight appears perfectly smooth, proves to be, when examined under the microscope, longitudinally corrugated. The larva is nearly half an inch long, white, with a brown head, and between the jaws is a row of hair as in the perfect insect. The posterior end is furnished with a pair of jaws very similar, though, of course, for a different purpose.

Trebolium furrugineum is a flat, reddish-brown beetle, about one-eighth of an inch long, appearing smooth to the naked eye, though the microscope shows the back numerously pitted. These insects affect patent foods and similar substances, and the beetles are possessed of remarkable longevity, as proved by the fact that I have kept a few alive for two months in a small box with a little cerealina, which seems to be their favorite food. Whether the beetles themselves eat it or not I do not know, but they certainly have a liking for the dead bodies of other beetles.

Silvanus surinamensis is a narrow, brown beetle, almost one-eighth of an inch long, with a pitted and longitudinally corrugated back. One specimen only was found, on anthemis.

Anthrenus varius.—This insect has been found only in cantharides, but I believe, also attacks other animal drugs, such as castoreum. During the month of July there emerges from the egg a very active larva, densely covered on the tops of the segments with stiff brown hairs, which, at the posterior end, point towards the centre of the back, form a ridge, and when the insect is annoyed, it has the power of dividing the ridge in the centre and throwing half down on each side in a fan-like position, the object of which movement could not be determined. When the insect has been feeding on the whole cantharides, all these hairs on the back become rubbed off, those forming the ridge being generally last to go, because, being on the downward slope of the body they are not exposed to the same amount of friction. Underneath, however, the hairs are shorter, and do not become rubbed off as on the back.

The larvæ consists of eleven segments, those at the ends being of a much deeper brown than those towards the middle, and the six legs being inserted on the three anterior segments, each furnished with a

short, straight claw. The skins are shed quite often during the larval state, and are discarded by a slit nearly the length of the back, terminating indifferently at either end, and through which the insect emerges. The shed skins present a beautiful iridescent appearance under the microscope when viewed by reflected light.

These larvæ feed on the cantharides all winter, and, if in quantity, commit great havoc, leaving only the hard exterior portions untouched, such as the upper portion of the thorax, the green wing cases, and transparent wings. When their legitimate food gives out they have no compunction about first eating their dead parents, and then each other, but on this diet they do not seem to thrive so well.

The beetle emerges in May or June, and is about one-eighth of an inch long, oval, and black, the upper parts being marbled and streaked with whitish and rufous, which are rubbed off after death if the insect is subjected to any rough usage.

Camphor does not kill these larvæ, and after keeping some for a day in a small box about a quarter full of camphor, the only thing worthy of remark in their actions was that they did not seem quite so lively as those kept without it. That they have a distaste for it, however, is proved by the fact that some which were put in a box with holes in it, left the box during the night. The Pharmacopœia direction to keep camphor with the cantharides is, therefore, not a *remedy*, merely a preventive measure, and not a very good one either. The vapor of chloroform rapidly kills them, so that by putting a small quantity of chloroform in a gallipot on the top of the infested cantharides, the heavy vapor will sink through it and destroy them.

NOTE.—The essay was accompanied with specimens of the larvæ, skins, and beetles, well mounted for examination by means of the microscope.—EDITOR.

Colored Flowers of the Carrot.—Mr. Thomas Meehan remarked that the umbellet of colored flowers in the centre of the umbel of the carrot was represented as usually fertile in Europe and sterile in the United States. He had always found them sterile here until 1882, when he discovered that those in the centre of the first umbel of the season were fertile, and those in the umbels from lateral shoots were sterile.—*Proceed. Acad. Nat. Sciences*, Phila., 1882, p. 221. (See also AMER. JOUR. PHAR., 1882, p. 585.)

ON THE PREPARATION OF HYDROBROMIC ACID.

By Thomas S. Wiegand, Ph.G.

Read at the Pharmaceutical Meeting, March 20.

One of the first things that attracts the attention of the apothecary in scanning the pages of the United States Pharmacopœia is the elimination of nearly all the processes for making chemicals; to one brought up to the business under the old regime it was thought that the preparation of everything directed by the Pharmacopœia, excepting those articles which required special apparatus or expensive outfit, was the peculiar duty of the pharmacist, and in view of this the Pharmacopœia was formerly so framed, but in our present code, so many of the formulas are omitted that their absence is a noted peculiarity and a great void is felt; it may be said in extenuation of these omissions that they can be made cheaper on the large scale than on the small one, but this does not render the omission any the less an omission, or a felt want more easily submitted to. To many the Pharmacopœia is a law, and to the law they are in the habit of looking for direction.

Among the formulas thus omitted is that for diluted hydrobromic acid. The formula for this preparation that has attracted most attention lately is the one published by Dr. E. R. Squibb, which consists of decomposing potassium bromide with an equivalent portion of sulphuric acid, washing the potassium sulphate to remove the adhering hydrobromic acid, and then concentrating and distilling; this is all quite possible, but so tedious and so likely to fracture the glass retorts from the "bumping," that it is quite unsatisfactory. The facility with which this article can be prepared by passing hydrogen sulphide into a mixture of bromine and water is such that no pharmacist need be at a loss to prepare it by the following process:

Having a flask fitted with a cork, which is perforated to receive a tube reaching just below the cork and rendered tight by waxing it, connect it by means of a piece of gum tubing with another tube bent at right angles; let the lower end of this tube dip to the bottom of a vessel which is shaped like a glass percolator, and, in fact, a glass percolator is the best for the purpose, and this is closed at the bottom with a rubber stopper and fitted with a close-fitting cap, through which the bent tube passes, and also another to prevent the gas from blowing off the cap. When these arrangements are made, a quantity of sul-

phide of iron is placed in the flask with some diluted sulphuric acid; this will supply the hydrogen sulphide. The bromine and water having been placed in the percolator, the gas is permitted to pass through it until all the bromine has been converted into hydrobromic acid, which will be indicated by its loss of color and of the peculiar odor of bromine; the solution is then filtered from the sulphur and concentrated to the specific gravity of 1·077, which corresponds with a ten per cent. solution, this being the strength indicated by the Pharmacopœia of 1880.

FERRIC CITRO-PHOSPHATE AND CITRO-PYROPHOSPHATE AND THEIR DOUBLE SALTS.

By R. Rother.

All acids, properly so called, are generated by the union of acid oxides and water, and bases are formed from basic oxides in a similar manner. This mode of action is distinctly chemical in what may be termed the upper end of the series, but towards the opposite extreme the chemical character becomes less and less distinct until in the vanishing terms its nature is wholly lost. In these latter cases the acid or basic oxide either remains insoluble or simply dissolves in the water, unattended by chemical effect. In those instances where chemism is exerted, the resulting compound is called either a hydrate, a hydroxide, or a hydride, according to the way in which its formula is written. For example, sulphuric acid can be indicated as $SO_3.OH_2$, as $SO_2(OH)_2$, or as SO_4H_2, or even as $SO_3H(OH)$. The first form would be termed sulphuric hydrate; the second, sulphuryl hydroxide; the third, sulphione hydride or hydric sulphate; and the fourth, sulphonic hydroxide. Caustic potash can be represented by $K_2O.OH_2$, K(OH), or (KO)H. The first would be potassic hydrate; the second, potassium hydroxide; and the third, potassoxyl hydride. There are numerous instances when a particular one of these forms would designate the combination more appropriately than another, but for general convenience and the sake of consistent uniformity in accord with the new nomenclature, these compounds are all styled hydrates. Now it is everywhere either distinctly enunciated or implied that a hydrate is generated by compounding water with an oxygenated radicle, and that the oxygenated radicle is reconstituted by its deprivation of the water. The fact, therefore, could not be clearer than that such a basic or acid

oxide must be an anhydrate. Nevertheless the statement is unceasingly made that these substances are anhydrides. Properly speaking, anhydrides would be the residues remaining after the removal of the typic hydrogen of the hydrates. But these residues, at the instant of their liberation, break up into the corresponding basic or acid oxides and free oxygen. The only exceptions, and but apparent at that, are the halogen radicles which, also freed in doublets, immediately combine to generate their respective elementary molecules.

The category of hydrates just discussed is that embraced within the scope of chemism proper and, therefore, representable by the full atomicity of the elements involved. There is, however, a widening series of undoubted chemical compounds containing water whose molecular formulas can only be expressed by the assumption of the unlimited subdivision of the atomic bonds, or the principle of ultravalence. Consistently these are also hydrates, and yet their anhydrates have nothing in common with those of the preceding order. These secondary hydrates are formed by the superposition of apparently arbitrary numbers of water molecules upon the hydrates proper or primary hydrates, salts, etc. The separation or increase of this water effects less radical changes in the residues, since its amount is readily varied by slight alterations in the attendant physical conditions; as, for instance, degree of concentration, temperature, and tension of the solution from which the hydrate formed, and the effects of the atmosphere on exposure.

It is very essential that a direct and clear distinction should be made in the nomenclature of these compounds. The first class may, therefore, be styled primary hydrates or simply hydrates, and the corresponding anhydrates be designated as *anhydric* oxides, etc. The second class may be termed secondary hydrates or hydrites, and the corresponding anhydrites be called *anhydrous* salts, etc.

Another false impression prevails in assuming so-called water of crystallization. This term has no meaning in relation to the act of crystallizing, since innumerable salts crystallize without combining with water. The absorption of water in this connection is not an effect of crystallization or *vice versa*, but merely a concomitant phenomenon.

In physics it has been found convenient to assume a crystallic force, but it is questionable if such a mode of motion exists as a distinct dynamic form. The crystalline condition is doubtless due to the fact

that matter following the line of least resistance is deposited by the composition and interference of movements in characteristic and definite forms. Physical illustrations of this action are found in the so-called nodal lines, and the formation of columnar basalt.

The very pertinent and apt expression Aq. was long ago adopted to distinguish the hydrous water of the hydrites from that which is more firmly held by the characteristic part of the compound, or the molecular nucleus. The hydrous water itself is combined in all degrees of tenacity from the hydrites, which lose the whole by simple exposure to such that part with the last portions only at a red heat, or total destruction of the compound. In the application of these hydrites it therefore becomes necessary to employ definite forms, or convert them into known conditions.

Ferric citrate was long considered by pharmacists to be anhydrous, but an appropriate degree of heat diminishes its weight by ten per cent., which loss is not augmented by an increased heat, short of the production of empyreuma. The hydrous water is therefore $1\frac{1}{2}$ Aq. The new Pharmacopœia, however, erroneously states it to be 3 Aq. Such a deviation from the true formula must naturally vitiate the products into which it enters, and this has occurred to all the processes in which the citrate is employed.

The formerly official pyrophosphate of iron is prepared by dissolving one molecule or m. of ferric pyrophosphate, $Fe_4(P_2O_7)_3$, in 3 ms. of triammonic citrate. The process in all its details, is, however, altogether too circumstantial for pharmacists to undertake. In view of this fact, the writer proposed ("American Journal of Pharmacy," April, 1876), an analogous compound to be produced by means of an inverse method whereby ferric citrate was made to react upon ammonic pyrophosphate. The proposition also embodied the substitution of sodic pyrophosphate in place of the ammonic salt. But the nearest approach to the then official compound contained an additional m. of trisodic citrate; that is, the result was represented by one m. of ferric pyrophosphate and 4 ms. of the citrate. This product was derived from the mixture of 4 ms. of ferric citrate and 3 ms. of sodic pyrophosphate. But the writer especially recommended a much simpler and richer iron compound, formed by mixing two ms. of ferric citrate and one m. of sodic pyrophosphate. This combination is closely analogous to the official salt, and has the strong probability in its favor of being a definite sodio-ferric citro-pyrophosphate. 272 grains of ferric citrate

and 223 grains of sodic pyrophosphate yield 405 grains of the salt, whose formula is therefore $Fe_2Na_4Ci_2(P_2O_7).3\,Aq.$, and molecular weight 810. Its constitutional formula is susceptible of quite a number of possible variations, but perhaps its most probable form is

$$\begin{array}{l} Fe = P_2O_7 \\ | \quad\quad \| \\ Ci - Na_4. \quad 3\,Aq. \\ | \quad\quad | \\ Fe = Ci \end{array}$$

It may hence be viewed as a derivative of the sodio-ferric pyrophosphate by replacing two pyrophosphoric by two citric radicles, which of course decreases the sodium by two ms.

$$\begin{array}{l} Fe = P_2O_7 \\ | \quad\quad \| \\ P_2O_7 = Na_6 \\ | \quad\quad \| \\ Fe = P_2O_7 \end{array}$$

The old official salt can also be considered as a mixture of two salts composed of one m. of the derivative just treated, and one m. of

$$\begin{array}{l} Fe = P_2O_7 \\ | \quad\quad \| \\ Ci - Na_5 \\ | \quad\quad \| \\ Fe = P_2O_7 \end{array}$$

Now instead of accepting the proposed salt it was deemed preferable to adopt the more complex salt into the Pharmacopœia, which is rendered still more indefinite by reason of the error regarding the formula of ferric citrate. The new salt is stated to contain 11·5 per cent. of metallic iron, which would make its molecular weight 1948, with somewhat less than 9½ ms. of hydrous water.

In the same paper ("American Journal of Pharmacy," April, 1876), on the inverse synthesis of these salts, the writer also proposed a sodio-ferric citrophosphate to be prepared by this general method. In this instance, however, no special recommendation was made. But the writer stated that the nearest approximation to the salt made by dissolving two ms. of ferric phosphate, $FePO_4$, in one m. of trisodic citrate, Na_3Ci, is obtained by mixing one m. of ferric citrate with one m. of trisodic phosphate. It was incidentally mentioned that ferric citrate, in considerable excess, formed green solutions with disodic phosphate. Upon this vague suggestion a compound was made official, represented by one m. of ferric citrate and one m. of disodic phosphate. It is to contain 13·5 per cent. of metallic iron, indicating a molecular weight of 415 with somewhat more than 1½ m. of hydrous water.

When 272 grains of ferric citrate is combined with 358 grains of disodic phosphate the resulting product weighs 405 grains. The formula of this salt is therefore,

$$\begin{matrix} Fe = PO_4 \\ | \\ Ci = Na_2H \end{matrix} \cdot \text{ Aq.}$$

and molecular weight 405.

A mixture of 272 grains of ferric citrate, 358 grains of disodic phosphate, and 84 grains of hydrosodic carbonate, yields a product weighing 445 grains. The formula of this salt is therefore

$$\begin{matrix} Fe = PO_4 \\ | \quad | \\ Ci = Na_3 \end{matrix} \cdot \text{ 2 Aq.}$$

and the molecular weight 445. It has an alkaline, unpleasant taste.

When 272 grains of ferric citrate, 179 grains of disodic phosphate, and 42 grains of hydrosodic carbonate are united, the result weighs 354 grains. The formula of the salt is consequently

$$\begin{matrix} Fe = PO_4 \\ \vdots \quad | \\ Ci - Na_3. \\ | \quad | \\ Fe = Ci \end{matrix} \text{ 3 Aq.}$$

and its molecular weight 708. This is an exceedingly elegant yellowish-green salt, having a sweetish, agreeable taste. It may be looked upon as a derivative of the salt formed by dissolving two ms. of ferric phosphate in one m. of trisodic citrate, whose formula is

$$\begin{matrix} Fe = PO_4 \\ | \quad | \\ Ci - Na_3. \\ | \quad | \\ Fe = PO_4 \end{matrix}$$

In that case one phosphoric radicle is replaced by one citric radicle. It may also be viewed as derived from one m. of ferric citro-phosphate ("American Journal of Pharmacy," April, 1876),

$$\begin{matrix} Fe = PO_4 \\ | \quad | \\ Ci = Fe \end{matrix}$$

by coalescence with one m. of trisodic citrate.

The formulas of these citro-phosphates, like those of the citro-pyrophosphates, are capable of taking a variety of different forms, indicating that the respective salts, under the proper conditions, may assume changed molecular characters. For instance, the ferric citro-phosphate above noted is largely decomposed into the two primary salts when dissolving the dried scales in water. The old official pyrophosphate is prone to a similar decomposition at the outset of dissolving it. All

of them before going into solution change from the sandy to the pasty condition, which process in some of them progresses very slowly.

It is the writer's opinion that the pyrophosphates in general are superfluous and comparatively valueless. They should be discarded in the exclusive favor of the orthophosphates. Pharmacists who prepare these salts for themselves are also advised, instead of scaling them, to evaporate and dry them, at a moderate heat, in large, shallow capsules. The salts are then obtained as sandy grains. The writer particularly recommends the trihydrous sodioferric citrophosphate already treated above. It can be very easily prepared by the following formula:

Ferric citrate,	544 parts.
Disodic phosphate, in transparent crystals,	358 "
Hydrosodic carbonate,	84 "
Water,	1,200 "

Place the ferric citrate, sodio-carbonate and water into a spacious capsule; then apply heat, and when effervescence ceases, add the sodic phosphate; stir until all the salts have dissolved, and evaporate the solution, at a moderate heat, to a syrupy consistence, and spread it on glass plates, to dry the salt in scales.

QUINIUM SALTS.

By R. Rother.

The quinium salts found in the general market, excepting the ordinary sulphate, are very much less in demand than this great staple salt. It is questionable whether any decided advantage attaches to the acid radicle which happens to be in combination with the quinic radicle in all other cases than where it is itself possessed of an inherent potency. The degree of solubility and diffusibility may render some effect, but for general purposes one salt, if sufficiently soluble, is perhaps as good as another. The salt which appeared earliest in the field of supply, all other things equal, became the dominant form. Had the chloride, instead of the sulphate, been first presented, its introduction would have followed as a matter of course. It is, indeed, to be regretted that this was not the case, since the chloride has more specially valuable qualities than are possessed by any other quinic salt. It firstly contains a greater per centage of quinine; secondly, it is more soluble in either alcohol or water than any other normal quinium salt; and thirdly, although incomparably more soluble than the normal sulphate, it is

much less bitter and less persistently bitter than this. Another advantage is that owing to its greater solubility all other less soluble salts of quinine can be prepared from it by double decomposition. Whilst being the staple form it would also be the cheapest salt of the market, and hence all the other varieties prepared from it would be correspondingly less costly than now.

In the usual course of preparing the various quinium salts from the sulphate two methods are in vogue. One consists in precipitating the base from the acid sulphate by means of caustic alkali, most generally ammonia, although sodium hydrate or disodic carbonate are preferable since the precipitate then is insoluble in excess of the reagent, and dissolving it in the proportional quantity of acid of which the salt is desired. By the other method either the normal or acid sulphate is decomposed by barium salts of the acid whose quinium compound is to be obtained. In addition to these general processes for preparing most of the salts occasionally called for, there are also certain advantageous modifications of these methods and a selection of special procedures for particular cases.

The employment of the base and acids directly as in the first general method is rarely desirable, although habitually formulated. The use of barium salts, though frequently directed, is not often resorted to. In the barium process the corresponding calcium salts are preferably substituted, in most cases, with superior effect. The process which is growing in popularity consists in the application of alcohol in conjunction with double decomposition. The operation is applicable by two methods. The first employs the alcohol in strong, the second in weak forms. By the first the entire precipitation of the by-product is aimed at. In the second only sufficient alcohol is added to the already completed reaction to effect the solution of the generated quinium salt in the least volume of aqueous menstruum.

Quinium chloride may be prepared by the first general method, that is, by uniting quinine directly with chlorhydric acid. It can also be obtained by the barium or calcium process from quinium sulphate and barium or calcium chloride. It may be expeditiously and effectively prepared from quinic sulphate and sodic chloride in the presence of alcohol. On evaporating the alcoholic solution, quinium chloride congeals to a crystalline mass. 872 parts of quinium sulphate, 117 parts of sodium chloride, and about 3,000 parts of alcohol are mixed and warmed until complete decomposition is effected. The solution is then

filtered from the crystalline sediment of sodic sulphate and evaporated to a syrupy consistence or until all or nearly all the alcohol is expelled. The dense solution may also be mixed with about 20,000 parts of hot water, when, on cooling, most of the chloride will crystallize in better defined shining needles.

When the evaporation of the dense residue at first obtained is continued, nearly all the water will then also be dissipated, and the product consist of the anhydrous chloride in a fused condition; on cooling it forms a crystalline mass. If, however, it is desired to obtain the hydrite, and water is added to the fused anhydrous chloride, it will not combine, but remain as a floating superstratum. On now lowering the temperature, and stirring the mixture meanwhile, the hydrite rapidly forms and the whole sets into a nearly dry, voluminous mass of crystals. This shape is the most convenient condition for dispensing purposes. The best process, however, for producing the chloride is afforded by taking advantage of its almost total insolubility in a saturated solution of sodium chloride. When any convenient amount of quinium sulphate is mixed with a hot filtered saturated solution of sodium chloride the quinium chloride is precipitated as a crystalline magma which rapidly agglutinates, and on cooling forms a compact, friable mass. On decanting the supernatant liquor and heating the residue several more times with sodium chloride solution all the generated sodium sulphate is removed. The quinium chloride, on heating with sufficient water, now dissolves, and on cooling crystallizes in the usuul manner.

Quinium hypophosphite is ordinarily made by dissolving the free base in hypophosphorous acid and crystallizing. The best result is obtained by dissolving 170 parts of calcium hypophosphite in 15,000 parts of water, heating the solution and adding 872 parts of quinium sulphate, filtering after the calcium sulphate has subsided and setting the solution aside to crystallize.

The union of *tannin with quinine* is perhaps the most peculiar and interesting compound of this alkaloid. In view of its excessive cost and asserted medicinal inferiority it is yet considerably used. The compound's lack of bitterness is probably the cause of its quite frequent employment. This salt, if salt the ordinary article may be called, as usually prepared, contains a very low, in fact the lowest percentage of quinine, and is also one of the most insoluble combinations of this base. Strictly speaking, it is incorrect to call the compounds of tannin

with bases salts. Tannin is the anhydrate of gallic acid; but like many other anhydric oxides, it does not generate the hydrate by direct contact with water. Similar to this order of oxides it needs the intervention of bases or either acids reinforced by a prolonged heat to induce a combination. After the completion of the reaction the product is of course gallic acid, either free or as gallate of the base. Ordinarily, however, tannin does unite in a certain way with bases as well as acids, but not by means of what are properly termed basic affinities, the resulting compounds are in no sense saline. They are not gallates, neither are they tannates; because gallic acid is not regenerated in this reaction, and tannic acid does not exist. An acid oxide contains no carboxylic hydrogen, replaceable by basic radicles, since the anhydrate is itself an oxygen substitution of this hydrogen. But in many cases the oxide is possessed of alcoholic hydroxyl, whose hydrogen can be replaced by other radicles under peculiar conditions. The organic acids are derivations of carbonic acid, $CO(OH)_2$, by substituting other radicles for a hydroxyl group. Their basicity depends upon the number of carboxyls or carbonic acid residues CO. OH, and their atomicity upon the number of hydroxyls, OH, contained within their molecule.

They may therefore be very conveniently termed mono, di, tri, etc., carbonic acids of the saturated hydrocarbon, whose hydrogen the carbonic acid residue displaces. Thus acetic acid is a methane carbonic acid, lactic acid an ethane hydrocarbonic acid, tartaric acid an ethane dihydro-dicarbonic acid, and citric acid a propane hydro-dicarbonic acid. Gallic acid is a benzene trihydrocarbonic acid, $C_6H_2(OH)_3$, $\cdot CO.OH$, and is therefore tetratomic and monobasic, its anhydrate being $2(C_6H_2(OH)_3CO)$. O, hence contains six alcoholic hydroxyls, whose hydrogen is replaceable by other radicles. The resulting compounds may properly be styled alcoholates and therefore the coalescenses of tannin with other molecules through the medium of its alcoholic hydroxyl are correctly termed tannolates. Tannin has a varied affinity for many substances, and in different degrees for the same body. It has a great propensity for combining with acids and neutral salts, though with some, as, for instance, acetic acid, it does not unite.

By reason of this peculiarity the quinium tannolate, as ordinarily prepared, contains a very large excess of tannin compounded with free acid, so as to constitute the article in reality a mixture. Manufacturers indeed endeavor to have the largest possible amount of tannin absorbed, deeming such a procedure perfectly legitimate, in view of

the fact that no recognized and definite standard for comparison exists. The bitterness of the substance of course diminishes in proportion to the deficiency of quinine contained in it, and the degree of its envelopment by the inert acid tannolate that is superadded. When quinine and tannin are mixed in equivalent proportion, that is, one m. of each, a tannolate is formed, but tannin remains in excess. When quinium sulphate, tannin and hydrosodic carbonate are mixed in equivalent proportion a tannolate is also formed, but tannin remains in excess as before. It seems, therefore, that tannin combines with quinine in a smaller proportion than one m. of each. The yield from 872 parts of quinium sulphate is 1,160 parts. Tannin, as already stated, has a great affinity for neutral salts. It unites with them directly, unattended by decomposition. When, for instance, tannin and potassic acetate are mixed, a voluminous buff-colored precipitate is immediately formed. On warming the mixture the precipitate gradually dissolves completely, but whilst this is taking place a portion of it agglutinates to a brown-green resinous mass. If the heat is now discontinued, the dissolved portion again gradually precipitates. By stirring this it also becomes adherent, but its color is now light-brown. Other portions of lighter and lighter tints may thus be successively obtained. Various other salts may likewise be produced of different shades with appropriate modifications of this method. The results show that the colored impurity of tannin attaches itself chiefly to the first formed parts of the precipitates. These secondary tannolates also have a powerful attraction for each other. For example, if quinium chloride is mixed with tannin in the proportion of their equivalents, namely, 414·5 and 322 parts respectively, a greenish-yellow tannolate is generated, but tannin remains largely in excess. But by adding in conjunction one m. of potassic acetate, 98 parts, the tannin is all absorbed into the resulting compound, but quinium chloride now remains in excess. The product in this case is in the proportion of 610 parts. Yet when two ms. of quinine chloride and one m. each of tannin and potassic acetate are used the yield is 780 parts, whilst the quinium chloride is again greatly in excess. It appears, therefore, that in this instance the acetate determines the absorption of all the tannin, at the same time taking precedence over the quinium salt.

When one m. of quinium sulphate, 872 parts, is treated with one m. of tannin, 322 parts, the average product is uniformly the same, 1085 parts, regardless whether potassic acetate or sulphate is also

added or not. The result is not altered when two ms. of tannin are added to one m. of the sulphate, under the same conditions in other respects. The acetate, although it does not seem to enter the product, yet facilitates the combination and filtration to such a degree as to render it a valuable adjuvant in the process. When the reaction is complete, no uncompounded tannin or quinium sulphate exists in the filtrate. The new compound is, however, slightly soluble in water. It has a distinctly crystalline form, the feathery lightness of quinium sulphate, and the color of gallic acid. It is very soluble in hot alcohol, from which most of it again separates on cooling. The hot alcoholic solution, when diluted with water lets fall the compound in amorphous flakes, which on standing contract and resume the crystalline condition.

Since the uniformity of the product manifested itself under so many varied conditions, and since a definite amount of material was wholly consumed in its generation, the formula of the compound may be written $(QnH)_2SO_4,HTn.$ Aq. with a molecular weight of 1086. The writer holds the opinion that this *quinium sulpho-tannolate* should replace all the other indefinite so-called tannates of quinine. It can be very easily prepared by the following formula:

Quinium sulphate	872 parts.
Tannin	322 "
Potassic acetate	98 "
Water sufficient.	

Dissolve the tannin and potassic acetate in 10,000 parts of water, with heat, then add the quinium sulphate, continue the heat for a few minutes, transfer the precipitate to a filter, and after sufficient washing dry it by exposure in the open air.

Syrup of yerba santa is growing in popularity as a vehicle for quinine in a tasteless form. As ordinarily prepared, it represents one ounce of the leaves in the pint. But this is stronger than need be for general purposes, and hence a syrup, containing half an ounce in the pint is a better form. The active agent is an acid resin which generates a nearly insoluble salt with quinine. This has the similarity of quinium tannolate, but differs from it in being a regular salt, which is readily soluble in ammonia, and decomposed by the common acids into the free acid resin and soluble quinium salt. The resin may be named *eriodictyonic acid*. It is dark brown in color, and has the flavor and odor of the leaves. It is soluble in alcohol, and acts on hydrosodic carbonate with effervescence, producing sodium eriodictyonate. This

is a deep brown-red salt, very soluble in water and in alcohol, but not possessed of any distinct crystalline form. Quinium eriodictyonate would be an excellent substitute for the indefinite quinium tannolates of the market. It can be easily and abundantly produced by extracting the leaves with water containing some alcohol and ammonia, and mixing the liquor with quinium sulphate, warming gently, washing the precipitate and drying it by exposure.

Syrup of yerba santa is best prepared by percolating one ounce of the leaves, in coarse powder, with an aqueous menstruum containing one drachm of ammonia water and two fluidounces of alcohol in the pint, until one pint of liquor is obtained, and dissolving twenty-eight troy-ounces of sugar in this, with a gentle heat. This syrup is clear and bright, having a deep brown-red color, and slightly bitter, but pleasant honey-like taste.

Quinium valerate is a very difficult salt to prepare by the usual method of dissolving the base in valeric acid. The union is not readily effected, and an early separation of the useless resinous modification occurs. Double decomposition is the only practical procedure. The salt appears in two crystalline forms, in star-grouped needles and in plates. The first kind are deposited from a hot saturated solution on cooling, the second form when a cold saturated solution is submitted to slow evaporation at a slightly elevated temperature. The first is the most practical form, and the most easily and plentifully produced.

A tolerably good method for preparing it in the tabular form consists in mixing 84 parts of hydrosodic carbonate, 102 parts of valeric acid and 2,500 part of water, then adding, after effervescence has ceased, 5,000 parts more of water and 414·5 parts of quinium chloride, heating until most of the pasty magma which results has dissolved, decanting the clear solution and heating the residue with sufficient more water to dissolve it. The solutions are then united and set away in a warm place, so that the valerate may slowly crystallize. Two-thirds of the valerate will thus be obtained. Subsequently only quinium chloride will again crystallize, owing to the fact that the sodium chloride generated in the weak solution permits the less soluble valerate to crystallize first, but on concentration the quinium chloride becomes the least soluble and hence this is regenerated and cast out of solution.

The employment of alcohol in conjunction with double decomposi-

tion between quinium sulphate and sodium valerate is also practical. 168 parts of hydrosodic carbonate, 204 parts of valeric acid and 500 parts of water are mixed, and when effervescence has ceased 5,000 parts of alcohol and 872 parts of quinium sulphate are added. The mixture is then warmed until decomposition is completed, filtered, mixed with 10,000 parts of hot water and set aside to crystallize.

The most advantageous and efficient process, however, is that by double decomposition between quinium sulphate and calcium valerate in the presence of weak alcohol. This yields the salt chiefly in splendid star crystals, although some plate crystals are formed in the mother liquor poured off from the first crop. The calcium valerate is generated by the action of valeric acid in aqueous solution on calcium carbonate. The reaction is almost instantly completed, with copious effervescence. The formula is as follows:

Quinium sulphate,	872 parts.
Valeric acid,	204 "
Calcium carbonate,	100 "
Alcohol,	
Water,	of each sufficient.

Mix the valeric acid with 5,000 parts of water, add the calcium carbonate, and, when effervescence has ceased and a clear solution has resulted, add 2,500 parts of alcohol and the quinium sulphate. Now heat the mixture until decomposition is complete; filter whilst hot, and rinse the residue of calcium sulphate with a little alcohol or weak alcohol, and set the filtrate aside to crystallize. Collect the crystals on a filter, and when drained expose them in the open air to dry. The drained liquor on evaporation will yield an additional crop of crystals.

Adulterated Saffron.—A new adulteration is described by Dr. J. Biel in "Phar. Zeitschr. f. Russland." It consists of calendula florets dyed with dinitrocresolate of sodium, then impregnated with oil, and rolled up length-wise. It is mixed with from 4 to 30 per cent. of true saffron, and was offered as Alicante saffron. The factitious article closely resembles disconnected styles of crocus, except that it is of uniform thickness, and is never attached to a yellow filiform style. It tinges water yellow like saffron, yields about the same amount of ash (9 against 8 per cent. for saffron), but imparts to petroleum-bezin a lemon-yellow color, while the coloring matter of saffron is not soluble in that liquid. Sodium dinitrocresolate, being cheap and innocuous, has been in use for some time for coloring liquors.

A NOTE ON MILK ANALYSIS.

By Henry Trimble, Ph.G.

Read at the Pharmaceutical Meeting, March 20.

In a paper read by Dr. P. Vieth before the Society of Public Analysists, of England, the figures representing the average of 12,349 analyses of milk were given, as follows:

Specific gravity,	Total solids,	Fat,	Solids, not fat,
1·0319.	13·03 per cent.	3·52 per cent.	9·51 per cent.

These samples were taken during the year 1882, and the results as given in "The Analyst," for March, show very curious and interesting variations for the different months.

In the same issue of this journal is a paper by Dr. W. D. Hogg, of Paris, on the work done by the "Paris Municipal Laboratory." This includes the average of 900 analyses of milk, with the following result:

Specific gravity,	Total solids,	Fat,	Solids, not fat,
1·033.	13 per cent.	4 per cent.	9 per cent.

I now give the average of thirteen analyses made by myself during the past eighteen months:

Specific gravity, 1·030. Total solids, 13·72 per cent.

Three of the samples were pure Alderney milk, the others were mostly samples that dealers suspected of adulteration. The fat was estimated in a few only, so I do not give it with the figures of the thirteen analyses, but may add that the average of the few determinations was 4·18 per cent. The extremes of specific gravity were 1·024 and 1·034, of total solids 11·63 and 15·73. With my limited experience I become more and more opposed to judging milk by the specific gravity. It is usually very close to 1·030, but very frequently a sample rich in fat will have a gravity as low as 1·028.

Japanese Fish-Oil.—The oil is extracted during the process of treating fish-scrap for fertilizing purposes, and was refined and used in Japan before the introduction of petroleum, for illuminating purposes. Recently a market for this oil has been found in Europe, chiefly in England, where it is used for about the same purposes as menhaden oil, which it resembles in appearance and properties. It is put up in five-gallon cans, two cans to the case, and sells in England at a price equivalent to 30 cents a gallon.—*Oil, Paint, and Drug Reporter*, 1882, Dec. 20th.

FLUID EXTRACTS OF THE NEW PHARMACOPŒIA.

By Alonzo Robbins.

Read at the Pharmaceutical Meeting, March 20.

(Continued from page 129.)

Extractum Krameriæ Fluidum.—*Fluid Extract of Krameria.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, three fluidounces of glycerin, and five fluidounces of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs diluted alcohol, with twenty per cent. of glycerin in the first one hundred parts of the menstruum, and the Philadelphia College of Pharmacy recommended the same. A sample thus made in December, 1879, has kept tolerably well, has almost no precipitate, is quite thick but not gelatinized, is of a deep red color, and not quite transparent in thin layers; another sample made at the same time, but with only ten per cent. of glycerin, is also without precipitate, is comparatively thin, of a deep red color, and perfectly transparent in thin layers. It would therefore seem that the officinal formula would be improved by the use of ten per cent. of glycerin instead of twenty.

Extractum Lactucarii Fluidum.—*Fluid Extract of Lactucarium.*—This is one of the eleven fluid extracts added to the list by the Committee of Revision. The Pharmacopœia directs a most elaborate and complicated procedure, which, if carefully worked out, yields a fluid extract that will, when mixed with syrup, furnish that much-desired preparation, a permanently clear syrup of lactucarium; although there is considerable demand for this syrup, it seems a pity that so much pharmaceutical skill and labor should be required for the preparation of a drug, of which a recognized medical authority speaks of as being possibly desirable for persons with whom faith in a remedy supplies its want of intrinsic efficiency.

Extractum Leptandræ Fluidum.—*Fluid Extract of Leptandra.*—This is one of the newly-introduced fluid extracts; the Pharmacopœia directs a menstruum composed of diluted alcohol, with fifteen per cent. of glycerin in the first one hundred parts, and the Philadelphia College of Pharmacy, two parts of alcohol, and one part of water; a sample thus made in November, 1879, contains now only a moderate precipitate, about the one-eighth of an inch deep in a four-

ounce bottle; the fluid extract appears to be in perfect condition. If glycerin is a necessary ingredient of the officinal menstruum, then that recommended by the Philadelphia College of Pharmacy is to be preferred, as the product keeps remarkably well without such addition.

EXTRACTUM LOBELIÆ FLUIDUM.—*Fluid Extract of Lobelia.*—This is also a newly-introduced preparation; the Pharmacopœia directs the use of diluted alcohol as the menstruum, and the Philadelphia College of Pharmacy recommended the same; a sample thus made in January, 1880, now contains only a slight precipitate, the sides of the bottle are free of deposit, except that above the fluid extract there is a small portion of waxy matter, otherwise the preparation has kept very well.

EXTRACTUM LUPULINI FLUIDUM.—*Fluid Extract of Lupulin.*—For this preparation the Pharmacopœia of 1870 directed stronger alcohol, the present Pharmacopœia directs alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum, and also that the powder be packed in the percolator without previously moistening it with a portion of the menstruum; this is a very good suggestion, as then the percolation proceeds evenly and without difficulty, while if the powder be first moistened, it is apt to form a tough mass, almost impossible to percolate. A sample of the fluid extract prepared in November, 1879, contains now only a very slight precipitate, and is in most excellent condition.

EXTRACTUM MATICO FLUIDUM.—*Fluid Extract of Matico.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of twelve fluidounces of alcohol, three fluidounces of glycerin, and one fluidounce of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs a menstruum composed of three parts of alcohol, and one part of water, with ten per cent. of glycerin in the first one hundred parts of the mixture; the Philadelphia College of Pharmacy recommended the same menstruum. A sample thus prepared in December, 1879, has now only the slight precipitate which formed soon after it was made, and is in every other respect in excellent condition; another sample prepared at the same time with alcohol, has also only a slight precipitate, but there is quite a large deposit of matter on the sides of the bottle; evidently the officinal menstruum is remarkably well suited for this preparation.

EXTRACTUM MEZEREI FLUIDUM.—*Fluid Extract of Mezereum.*—

For this preparation the Pharmacopœia of 1870 directed stronger alcohol, the present Pharmacopœia directs alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum; a sample thus prepared in December, 1879, has now only a slight precipitate and a very thin coating of matter on the sides of the bottle, otherwise the preparation has kept very well.

EXTRACTUM NUCIS VOMICÆ FLUIDUM.—*Fluid Extract of Nux Vomica.*—This is one of the eleven fluid extracts added to the list by the Committee of Revision; the Pharmacopœia directs a menstruum composed of eight parts of alcohol and one part of water, which will no doubt thoroughly exhaust the drug; the chief utility of this preparation would seem to be its availability for the quick preparation of the abstract, solid extract and, perhaps, the tincture of nux vomica.

EXTRACTUM PAREIARÆ FLUIDUM.—*Fluid Extract of Pareira.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, three fluidounces of glycerin, and five fluidounces of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs diluted alcohol, with twenty per cent. of glycerin in the first one hundred parts of menstruum; and the Philadelphia College of Pharmacy recommended the same. A sample thus prepared in October, 1879, kept well for a considerable time, and now contains only a moderate precipitate, about the one-fourth of an inch deep in a four-ounce bottle, but there is also a thick deposit of a transparent brown substance on the sides of the bottle; another sample prepared at the same time, with a menstruum composed of one part of alcohol, and three parts of water, and twenty per cent. of glycerin, now contains a large deposit, over half an inch deep in a four-ounce bottle; there is also a deposit on the sides of the bottle, but not near so thick as that on the sides of the other bottle. The condition of these samples seems to indicate that a more alcoholic menstruum is required for the preservation of this preparation, and it is probable that one containing not less than three parts of alcohol to one of water, with the same quantity of glycerin as is now directed, would accomplish the object.

EXTRACTUM PILOCARPI FLUIDUM.—*Fluid Extract of Pilocarpus.*—For this newly-introduced preparation the Pharmacopœia directs the use of diluted alcohol as the menstruum; the Philadelphia College of Pharmacy recommended one part of alcohol and two parts of water;

a sample thus prepared in December, 1879, now contains only a slight precipitate and a very thin coating on the sides of the bottle; the fluid extract is perfectly transparent and of a deep red color in thin layers; another sample recently made with the officinal menstruum has also a deposit about equal in amount to that of the first sample, but it is of a much darker color; this fluid extract is also darker than the older sample, but this may be owing to the larger proportion of brown leaves found in Jaborandi of late. While the officinal menstruum produces an excellent preparation, the weaker menstruum recommended by the Philadelphia College of Pharmacy is evidently just as good for the extraction of the drug and preservation of the product.

EXTRACTUM PODOPHYLLI FLUIDUM.—*Fluid Extract of Podophyllum.*—This is also a new officinal preparation. The Pharmacopœia directs a menstruum composed of three parts of alcohol and one part of water; the Philadelphia College of Pharmacy recommended alcohol; a sample thus prepared in November, 1879, contains now only a very minute precipitate, and the fluid extract is of a bright red color, brilliantly transparent; a second sample, prepared at the same time, with the now officinal menstruum, contains a little larger, but still a very small precipitate, this fluid extract is very dark, but perfectly transparent, and of a deep red color in thin layers. It is evident that either of these menstruums will yield an excellent preparation, and although alcohol may be the more scientific, the preference seems to be due to the weaker officinal menstruum.

EXTRACTUM PRUNI VIRGINIANÆ FLUIDUM.—*Fluid Extract of Wild Cherry.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of four fluidounces of glycerin, and eight fluidounces of water, finishing the percolation with stronger alcohol. The present Pharmacopœia directs one hundred grammes of wild cherry in number twenty powder to be moistened with fifty grammes of a mixture of two parts of water and one part of glycerin, and then set aside for forty-eight hours; the damp powder is then to be packed in the percolator, saturated with diluted alcohol, and again macerated for forty-eight hours; then the percolation is allowed to proceed, adding diluted alcohol, until the wild cherry is exhausted; the first eighty cubic centimeters of the percolate are reserved, the next one hundred and twenty cubic centimeters are to be evaporated to a thin syrup, the alcohol is to be distilled from the remainder of the percolate, and the residue of this is also to be evaporated to a thin

syrup; the two syrupy liquids are to be united and evaporated on a water-bath to a soft extract, which is to be dissolved in the reserved portion, and enough diluted alcohol added to make the fluid extract measure one hundred cubic centimeters.

The Philadelphia College of Pharmacy recommended the following process: one hundred parts of wild cherry in number forty powder are to be moistened with fifty parts of water and set aside for twenty-four hours; twenty parts of sugar are then to be mixed with the damp powder, and the whole packed in a percolator and saturated with a mixture of one part of alcohol and six parts of water, and allowed to macerate for forty-eight hours; then the percolation is allowed to proceed, adding the same mixture of alcohol and water, until the wild cherry is exhausted. The first eighty parts of the percolate are to be reserved, ten parts of glycerin are to be added to the remainder, which is then to be evaporated to a soft extract, this is to be dissolved in the reserved portion, and a sufficient quantity of the menstruum added to make one hundred parts. A sample thus prepared in October, 1879, deposited in about four months after it was made a very slight precipitate, less than the one-eighth of an inch deep in a four-ounce bottle; this precipitate has not been increased perceptibly up to the present time, the odor of hydrocyanic acid has also disappeared, in other respects the same is in good condition, dark red in color, and perfectly transparent in thin layers. This formula was recommended only after a great many experiments with various proportions of alcohol, water, and glycerin; it has stood the test of time as well as any formula for this preparation can be expected to do, a partially filled bottle, exposed on a shelf in the store, and frequently opened, had not entirely lost the hydrocyanic acid odor in ten months. This odor will probably not be retained by any method for a great length of time; any sample of this fluid extract possessing it in a marked degree more than a year after its preparation, might justly be suspected of having had an addition of the oil of bitter almonds. Recently two new samples were made, one by the officinal and the other by the Philadelphia College formula; at present they both possess the hydrocyanic acid odor and taste in a marked degree, but the officinal has a very large precipitate, fully three-fourths of an inch deep in a four-ounce bottle; this precipitate, however, is probably composed of inert substances chiefly; the other sample is perfectly clear and has formed no precipitate. The fluid

extract made by either of these formulas yields clear solutions in all proportions with syrup, simple elixir, and sherry wine.

Of the two formulas, that of the Philadelphia College of Pharmacy seems to be preferable for simplicity, economy, and permanence of product; the use of sugar in this fluid extract would not have been recommended had it not been considered to have a decidedly beneficial effect in preserving the preparation.

EXTRACTUM QUASSIÆ FLUIDUM.—*Fluid Extract of Quassia.*—This is one of the eleven added to the list by the Committee of Revision; the menstruum directed is diluted alcohol, which will no doubt thoroughly exhaust the drug.

EXTRACTUM RHEI FLUIDUM.—*Fluid Extract of Rhubarb.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of fourteen fluidounces of alcohol and two fluidounces of glycerin, finishing the percolation with a sufficient quantity of a mixture of two volumes of alcohol and one of water. The present Pharmacopœia directs three parts of alcohol and one part of water, and the Philadelphia College of Pharmacy recommended the same menstruum.

After many preliminary experiments, seven samples were prepared in August, 1879, the menstruum employed for each, the results obtained, and the present condition of the product of each of the series is, for the convenience of comparison, arranged in tabular form.

Number.	Menstruum.	Per cent. of glycerin.	Reserve percolate.	Sp. grav. of fluid extract.	Per cent. of dry extract.	Per cent. of dry residue.	Present condition of fluid extract.
1	A2. W1.		75	1·133	40·30	51·15	Moderate precipitate, thick and lumpy.
2	A3. W1.		75	1·102	40·17	51·80	Very slight precipitate, rather thick, but good.
3	A4. W1.		75	1·094	40·10	53·30	Very slight precipitate, thin, very good.
4	A2. W1.	20	65	1·192	60·	51·25	No precipitate, very thick, barely fluid.
5	A5. W1.	20	70	1·147	60·	51·50	Precipitate on bottom and sides, thick and bad.
6	Alcohol	20	75	1·114	50·	57·42	Very large precipitate on bottom and sides, thin.
7	Alcohol	20	75	1·108	50·	57·39	Same as number six.

Number two is the formula recommended to, and finally adopted by, the Committee of Revision; it remains at present in good condition, but is rather thick and lumpy, and in this respect only is inferior to number three, which has kept better than any of the other samples. From the rapidity of exhaustion, and the appearance of the fluid extract when first made, it seemed that alcohol, with twenty per cent. of glycerin in the first one hundred parts, would be the best menstruum for this drug; therefore two samples, numbers six and seven, were so prepared to more thoroughly test the menstruum; the product precipitated considerably in a few months, and now contains a very large deposit on the bottom and sides of the bottles, the remainder of the preparation is quite fluid and transparent in thin layers; samples numbers four and five, which also contain twenty per cent. of glycerin, likewise proved failures, and the result of these experiments appears to fully demonstrate, not only that glycerin is of no service in this preparation, but also that its employment is decidedly detrimental to the permanence of the product. Sample number three having undergone no change since its preparation, the menstruum therein used, four parts of alcohol and one part of water, is recommended in place of the present officinal menstruum.

Extractum Rhois Glabræ Fluidum.—*Fluid Extract of Rhus Glabra.*—This is a newly-introduced preparation; the Pharmacopœia directs diluted alcohol, with ten per cent. of glycerin, in the first one hundred parts of the menstruum. The Philadelphia College of Pharmacy recommended a menstruum composed of one part of alcohol and two parts of water, with twenty per cent. of glycerin in the first one hundred parts; a sample thus prepared in December, 1879, contains now only a minute precipitate, is perfectly fluid, of a deep red color, and transparent in thin layers; this sample has kept so well it would seem impossible for the officinal, or any other menstruum, to yield a better preparation.

Extractum Rosæ Fluidum.—*Fluid Extract of Rose.*—This is one of the eleven added to the list by the Committee of Revision; the Pharmacopœia directs diluted alcohol, with ten per cent. of glycerin in the first one hundred parts of the menstruum; the product will no doubt well represent red rose, and perhaps prove a useful addition to the practice of elegant pharmacy; it would seem that this fluid extract might as well have been directed for the preparation of the honey of rose, as for the syrup.

EXTRACTUM RUBI FLUIDUM.—*Fluid Extract of Rubus.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, three fluidounces of glycerin, and five fluidounces of water, finishing the percolation with diluted alcohol, and adding one fluidounce of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs forty-five grammes of alcohol, thirty-five of water, and twenty of glycerin, and then finishes the percolation with a sufficient quantity of a mixture of nine parts of alcohol to seven parts of water. The Philadelphia College of Pharmacy recommended diluted alcohol, with ten[1] per cent. of glycerin in the first one hundred parts of menstruum; a sample thus prepared in January, 1880, now contains a rather large precipitate, about half an inch deep in a four-ounce bottle, the fluid extract appears to be in good condition, is very dark, brownish-red, and transparent in thin layers. The officinal menstruum differs chiefly in containing ten per cent. more of glycerin, as the very unusual proportions of nine parts of alcohol to seven parts of water, really is less than six per cent. stronger than diluted alcohol; another sample prepared at the same time as the first, with a menstruum composed of two parts of alcohol to one part of water, and also containing ten per cent. of glycerin, now contains only a very slight deposit, and is in every other respect remarkably well preserved; this menstruum would therefore seem better adapted to blackberry bark than the officinal.

EXTRACTUM RUMICIS FLUIDUM.—*Fluid Extract of Rumex.*—For this newly-introduced preparation the Pharmacopœia directs diluted alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum; a sample thus prepared in January, 1880, has only a slight precipitate, and is otherwise in excellent condition.

EXTRACTUM SABINÆ FLUIDUM.—*Fluid Extract of Savine.*—For this preparation the Pharmacopœia of 1870, the present Pharmacopœia, and the Philadelphia College of Pharmacy all agree in the use of alcohol as the menstruum; a sample thus prepared in December, 1879, now contains only a very slight precipitate, and is otherwise in excellent condition.

EXTRACTUM SANGUINARIÆ FLUIDUM.—*Fluid Extract of Sanguinaria.*—For this newly-introduced preparation the Pharmacopœia directs the use of alcohol as the menstruum; the Philadelphia College of Pharmacy recommended two parts of alcohol and one part of water,

[1] In the table this was incorrectly given as twenty parts.

adding one per cent. of acetic acid to the dilute percolate before evaporation; a sample thus prepared in January, 1880, now contains only a moderate precipitate, but the sides of the bottle are thickly coated with a transparent yellowish-red substance; the fluid extract is still very dark in color, transparent and deep red in thin layers. The product of the officinal menstruum may undergo less change, but it is doubtful that this preparation can ever be made permanent.

EXTRACTUM SARSAPARILLÆ COMPOSITUM FLUIDUM.—*Compound Fluid Extract of Sarsaparilla.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of eight fluidounces of alcohol, four fluidounces of glycerin, and four fluidounces of water, finishing the percolation with diluted alcohol, and adding four fluidounces of glycerin to the dilute percolate before evaporation. The present Pharmacopœia directs a menstruum composed of one part of alcohol and two parts of water, with ten per cent. of glycerin in the first one hundred parts; the Philadelphia College of Pharmacy recommended the same menstruum, and one part more of glycyrrhiza and one part less of mezereum than the Pharmacopœia directs; a sample thus prepared in January, 1880, now contains only a moderate precipitate, and is otherwise in good condition.

EXTRACTUM SARSAPARILLÆ FLUIDUM.—*Fluid Extract of Sarsaparilla.*—For this preparation the menstruum employed is the same as that for the compound fluid extract; a sample prepared in December, 1879, now contains a rather large precipitate, nearly half an inch deep in a four-ounce bottle; the fluid extract is very dark-brown in color, and appears to be in good condition.

EXTRACTUM SCILLÆ FLUIDUM.—*Fluid Extract of Squill.*—For this preparation the Pharmacopœia of 1870 directed a menstruum composed of fourteen fluidounces of alcohol and two fluidounces of glycerin, finishing the percolation with alcohol. The present Pharmacopœia directs alcohol, and the Philadelphia College of Pharmacy recommended the same menstruum; a sample thus prepared in June, 1879, is now entirely without precipitate, and appears to have undergone no change whatever.

The choice of menstruum was between that used in the above formula and diluted alcohol, which also furnishes a transparent and permanent fluid extract, but not more than fifty parts of the percolate can be reserved when this menstruum is used, as the dilute percolate contains a large proportion of gummy matter; various intermediate

strengths of menstruum were experimented with, but in each case the product separated into two clear layers, which became milky when shaken together.

EXTRACTUM SCUTELLARIÆ FLUIDUM.—*Fluid Extract of Scutellaria.*—This is one of the newly-introduced fluid extracts; the Pharmacopœia directs a menstruum composed of one part of alcohol and two parts of water; the Philadelphia College of Pharmacy recommended diluted alcohol; a sample thus prepared in December, 1879, now has some oily matter on the sides of the bottle above the fluid extract, and also contains quite a large precipitate, which is divided into two equal layers, the lower of a bright green, and the upper of a dull brown color, the fluid extract otherwise is in rather bad condition; diluted alcohol is evidently not suited for this preparation, but the remedy would seem to be more in the direction of a stronger menstruum than a weaker one, such as the officinal.

(To be continued.)

GALENICAL PREPARATIONS OF THE GERMAN PHARMACOPŒIA.

(Continued from page 134.)

Tinctura Castorei.—Castor 1 part, alcohol (sp. gr. ·832) 10 parts. Dark red-brown; odor strong castor-like. Mixed with 4 or 5 volumes of water, it becomes milky, and after being well shaken, gives a copious precipitate of resin, the liquid becoming nearly clear and colorless.

Tinctura Catechu.—Catechu (from Uncaria Gambir and Areca Catechu) 1 part, alcohol (sp. gr. ·894). Dark red-brown, pellucid in thin layers; colored dingy green by ferric chloride; on boiling with a little potassium chromate, deep cherry colored.

Tinctura Chinioïdini.—Chinoidine 10 parts, alcohol (sp. gr. ·894) 85 parts, hydrochloric acid (sp. gr. 1·124) 5 parts. Dark brown, transparent in thin layers; on being mixed with an equal bulk each of water and ammonia water, the chinoidine is precipitated, the liquid becoming yellowish.

Tinctura Colocynthidis.—Colocynth with the seeds 1 part, alcohol 10 parts. Yellow, very bitter.

Tinctura Ferri acetici ætherea.—Solution of ferric acetate (sp. gr. 1·082) 80 parts, alcohol 12 parts, acetic ether 8 parts; cool while mix-

ing. Specific gravity 1·044 to 1·046; not rendered turbid by water; contains 4 per cent. of iron; keep in a dark place.

Tinctura Ferri chlorati ætherea.—Solution of ferric chloride (sp. gr. 1·281) 1 part, ether 2 parts, alcohol 7 parts; expose in a well-stoppered white glass bottle to the sunlight until the color has disappeared; then keep in a shady place, removing the stopper occasionally until the tincture has acquired a yellow color. Specific gravity ·850 to ·854; contains 1 per cent. of iron; after dilution with water both ferrocyanide and ferricyanide of potassium produce blue precipitates, ammonia a black precipitate.

Tinctura Ferri pomata.—Extract. ferri pom. (see page 81) 1 part, cinnamon water 9 parts. Blackish-brown, of a mild ferruginous taste.

Tinctura Gentianæ.—Gentian 1 part, alcohol (sp. gr. ·894) 5 parts, Yellowish brown-red, very bitter.

Tinctura Ipecacuanhæ.—Ipecac 1 part, alcohol (sp. gr. ·894) 10 parts. Reddish brown-yellow, bitterish.

Tinctura Pimpinellæ.—Burnet saxifrage root 1 part, alcohol (sp. gr. ·894) 5 parts. Brownish-yellow, taste nauseous and acrid.

Tinctura Rhei aquosa.—Rhubarb (cut and free from powder) 100 parts, borax and potassium carbonate each 10 parts, boiling water 900 parts; after 15 minutes add alcohol 90 parts, macerate for one hour, pass through a woolen strainer, express lightly, and with 850 parts of the liquid mix 150 parts of cinnamon water. It is deep red-brown, pellucid in thin layers, and is not rendered turbid by water.

Tinctura Valerianæ ætherea.—Valerian 1 part, spirit of ether 5 parts. It is of a yellow color.

Tinctura Veratri.—White veratrum 1 part, alcohol (sp. gr. ·894) 10 parts. Reddish dark-brown, bitter and acrid.

Trochisci are prepared by triturating the medicinal substance thoroughly with sufficient powdered sugar, dampening the powder with alcohol, and then compressing so that each troche shall weigh 1 gram.

The same weight is also directed for troches made with cacao mass, for which purpose equal weights of cacao and sugar are melted together by the aid of a steam-bath, and thoroughly incorporated with the medicament; the half-cooled mass is formed into the requisite number of troches.

Trochisci Santonini contain ·025 gram (gr. ·386) of santonin

Unguenta.—The ingredient having the higher melting point is fused by itself or with the addition of a small portion of the more readily fusible ingredient, then the latter is added in small quantities, care being taken not to increase the heat unnecessarily. Ointments consisting of wax or resin and lard or oil, when melted, require to be continually stirred until cool; watery substances are to be incorporated while cooling; powders should be very fine, if necessary elutriated, and should be triturated with a little oil or melted ointment; extracts and salts should be triturated with, or dissolved in, water, except tartar emetic, which must be rubbed to a very fine powder before being incorporated.

The ointments of the German Pharmacopœia embrace also preparations of the consistence of cerates, as recognized by the U. S. Pharmacopœia.

Unguentum Cantharidum.—Coarsely powdered cantharides 2 parts, olive oil 8 parts; digest for ten hours in a steam bath, express, filter, and to 7 parts of the filtrate add yellow wax 3 parts.

Unguentum Glycerini.—Powdered tragacanth 1 part, alcohol 5 parts; triturate together, mix with glycerin 50 parts and heat in a steam bath until the mixture forms a uniform, white and diaphanous mass.

Unguentum Paraffini.—Paraffin 1 part, paraffin oil 4 parts. White, diaphanous, melting between 35° and 45° C.; showing minute crystals under the microscope.

This is evidently intended as a substitute for the soft, jelly-like paraffins, which are found in the market under various names. That formulas like this one are entirely impracticable has been shown in 1873 and 1875 by Dr. A. W. Miller and Mr. J. L. Lemberger.

Unguentum Plumbi.—Lard 92 parts, solution of subacetate of lead 8 parts.

Unguentum Plumbi tannici.—Tannin 1 part, solution of subacetate of lead 2 parts; triturate to a uniform pulpy mass and mix with lard 17 parts.

Unguentum Rosmarini compositum.—Lard 16 parts, suet 8 parts, yellow wax and expressed oil of nutmeg each 2 parts; to this add oil of rosemary and oil of juniper each 1 part. It is yellowish.

Unguentum Tartari stibiati.—Tartar emetic 2 parts, paraffin ointment 8 parts.

Unguentum Terebinthinæ.—Turpentine, yellow wax, oil of turpentine, equal parts.

Vinum camphoratum.—Dissolve camphor 1 part in alcohol 1 part, and gradually add, with agitation, to a mixture of mucilage of gum arabic 3 parts and good white wine 45 parts. Whitish, turbid.

Vinum Chinæ.—Mix tincture of cinchona and glycerin, of each 100 parts with sherry wine 300 parts, and after three weeks filter. Clear, brown-red.

Vinum Pepsini.—Triturate pepsin, glycerin, and water, each 50 parts, to a uniform mixture, add good white wine 1845 parts and hydrochloric acid 5 parts; macerate for 6 days, shaking frequently, then filter. Clear, yellowish.

ANALYTICAL RESEARCHES AND INVESTIGATIONS.

COLLATED BY PROF. FREDERICK B. POWER, PH.D.

The Obtainment of Morphine in a Pure State in Forensic Investigations. By Edmund Scheibe.—In the determination of organic poisons in portions of a cadaver, articles of food, etc., the difficulty has to be contended with that with the isolation of the poison, coloring matters, and other constituents of the subject under examination are at the same time isolated, which interfere with the reactions. This is especially the case with morphine, which is usually extracted by means of warm amylic alcohol, this indeed, being best adapted to the purpose, but at the same time taking up many impurities. Since morphine is abstracted from the alkaline solution by amylic alcohol, it is customary for the removal of the impurities to first agitate the acid solution with amylic alcohol. If, however, for the purpose of further treatment the acid solution is rendered alkaline, forms of impurities are again produced which pass into the amylic alcohol. If the liquid be again acidulated, and the operation repeated, the danger is incurred of losing much of the sought-for poison or of causing its decomposition.

After a series of experiments for obtaining the alkaloid in a pure form with the use of various etherial and other liquids, the author has come to the conclusion that a mixture of 10 parts of ether and 1 part of alcohol is well adapted to the purpose.

For such cases, therefore, in which the separation of small amounts of morphine is required, the following method is proposed:

The finely-divided portions of the cadaver are repeatedly extracted with acidulated water (urine and other liquids being first concentrated by evaporation), the combined liquids filtered, evaporated to nearly a syrupy consistence on a water-bath, extracted with from 4 to 5 times its volume of 95 per cent. alcohol, again filtered, the filtrate freed from alcohol by distillation, the residue in the retort again filtered and then shaken with amylic alcohol as long as coloring matters continue to be abstracted. Thereupon the acid solution is heated to from 50 to 60°C., an equal volume of amylic alcohol added and agitated, the liquid then made alkaline with ammonia water, and again agitated for some time. After the separation and removal of the amylic alcohol from the aqueous liquid, the operation is repeated by agitation with a fresh portion of amylic alcohol. The amylic alcohol liquids are then distilled or allowed to volatilize on a water-bath, the residue evaporated to dryness, and by the aid of a gentle heat, repeatedly extracted with slightly acidulated water. The acid liquids are then filtered, and the filter carefully washed. It is advisable to again agitate the acid filtrate with amylic alcohol, for the removal of the coloring matters, and then pour upon the separated acid liquid the above-mentioned mixture of 10 parts of anhydrous ether and 1 part of 95 per cent. alcohol, to make alkaline with ammonia water, and agitate. This agitation with ether-alcohol is to be repeated several times. In this way the morphine may be obtained, so deprived of coloring matters that all the reactions for the alkaloid may at once be applied.—*Pharm. Ztschr. für Russland*, No. 4, 1883, pp. 49-51.

The Isolation of the Poisonous Principle of Certain Species of Lupine. By Carl Arnold.—The principle contained in many lupines, which produces the so-called lupinose disease, may be isolated, together with some albumin, by the following method: The finely ground toxic lupines are mixed to the form of a thin paste with water containing 2 per cent. of anhydrous sodium carbonate, at a temperature of 40 to 50°C., and the mixture allowed to macerate for 2 days at the ordinary temperature. The liquid obtained therefrom by expression is concentrated as far as possible, at a temperature not exceeding 60°C., after having been previously neutralized with acetic acid. To the cooled liquid concentrated acid is then carefully added until no further precipitate is produced; the acid liquid is filtered from the ensuing precipitate of legumin, concentrated on the water-bath, at a temperature not exceeding 60°C., to the consistence of a thick syrup, and then poured

into 15 times its volume of 90 per cent. alcohol. After standing for 24 hours the obtained precipitate is collected and pressed, and dried between filtering paper. The mass so obtained possesses a shining, brown, resinous appearance, an agreeably aromatic odor and taste, dissolves slowly in water, with the formation of a turbid liquid, and produces in animals, even when administered in small doses (about 10 grams), acute jaundice, as also the other symptoms of lupinosis.—*Ber. der Deutsch. Chem. Ges.*, No. 4, 1883, p. 461.

The Detection of Organic Acids in Carbolic Acid. By W. Bachmeyer.—An aqueous decoction of red-wood becomes decolorized by the addition of one drop of a concentrated inorganic acid, but upon the further addition of acid it becomes again red; organic acids produce a permanent decoloration, whereas carbolic acid, or phenol, produces scarcely any change of color.—*Chem. Zeitung*, No. 76, p. 1346, from *Ztschr. Anal. Chem.*, 21, p. 552.

A New Volumetric Solution for the Estimation of the Hardness of Water. By C. R. C. Tichborne.—The estimation is accomplished with a solution of soap, which is prepared in the following manner: 5 cubic centimeters of oleic acid are measured off with a pipette, and mixed with 50 cubic centimeters of alcohol in a beaker, then 8 drops of phenolphthaleïn solution are added, and subsequently normal soda solution, $\frac{NaHO}{1000}$, until a pale red coloration is just produced. The liquid is then diluted with equal parts of alcohol and water until the required volume of normal solution is obtained. 32 cubic centimeters of this solution, when required for 100 cubic centimeters of water, indicate 16° of hardness per gallon, according to Clark's scale.—*Ibid.*, p. 1347, from *Chem. News*, 46, p. 235.

The Separation of Asparagin from Liquids. By E. Schulze.—A precipitant for asparagin has heretofore remained unknown, and the author recommends as such mercuric nitrate. By the decomposition of the white precipitate so obtained by hydrogen sulphide, the asparagin can again be obtained. This reaction may also be utilized for the separation of asparagin from plant extracts.—*Ibid.*, No. 82, p. 1441, from *Ber. der Deutsch. Chem. Ges.*, 15, p. 2837.

On the Poisonous Action of Human Urine. By Balduino Bocci.—Normal human urine, when injected under the skin of frogs, produces under certain conditions a lameness of the animal, which results also

eventually in its death. The action of urine is thus similar to that of curare. The urine of vigorous men in middle life possesses the strongest action, that of females is less powerful, and that of aged persons and children is the weakest. Upon mammals the toxic action is very slight, producing with these at the most but transitory depression, and not occasioning lameness.—*Ibid.*, No. 6, 1883, p. 76, from *Cen. Blatt für Med. Wiss.*, 1882, p. 929.

Contributions to the Knowledge of the Pharmacological Group of Digitalin. By O. Schmiedeberg.—From oleander leaves from Tunis the author has separated as active constituents the so-called *neriantin*, or oleander-digitalin, and *oleandrin*. The oleandrin possesses all the properties which characterize the digitalin group, while neriantin is to be regarded as a glucoside, and has only a feeble action. The author has furthermore isolated from the North American Apocynum cannabinum, *L.*, two substances which belong to the digitalin group, namely, *apocynin* and *apocynëin*. The former has a violent action, similar to oleandrin, while the latter is a glucoside, and of much more feeble action.—*Ibid.*, No. 14, p. 204, from *ibid.*, 1883, p. 60.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Constituents of Tamarinds.—Carl Mueller examined 9 samples of East Indian tamarinds with the following results:

Seeds.	Pulp free from seeds.					Dry pulp.	
	Water.	Insoluble.	Potass. Bitart.	Tartaric acid.	Citric acid.	Potass. Bitart.	Tartar. acid.
Highest per ct., 38·0	30·81	20·2	6·01	8·80	3·95	8·25	12·25
Lowest per ct., 1·5	21·92	12·2	4·66	5·29	0·64	6·21	6·77
Average per ct., 13·9	27·00	16·2	5·27	6·63	2·20	7·20	9·09

The author found very small quantities of malic acid, which were calculated as citric acid. In his opinion, tamarinds should not contain more seeds than 10 per cent. of their weight; four of the samples contained considerably less (1·5, 2·4, 4·5, 6·0), two approached this limit (8·7, 9·8), and three exceeded it considerably (20·6, 23·3, 38·0).—*Phar. Centralh.*, 1882, Nos. 49, 50.

Constituents of Trifolium pratense.—Fred. Grazer examined the

flower heads of red clover and found 2 resins, fat, chlorophyll, glucose, tannin, gum, an acid principle, and extractive matter; the resin soluble in ether dissolved in ammonia with a green color, and in potassa with a yellow color. The ash amounted to 7½ per cent. and consisted of carbonates and phosphates of magnesium, potassium, and calcium, and of oxide of iron.—*Proc. Cal. Phar. Soc.*, 1883, p. 49.

Polygonum Hydropiperoides, Mich.—An editorial in the "Medical News," Dec. 9, 1882, directs attention to this indigenous plant, of which the late Dr. Eberle, in his work on Materia Medica and Therapeutics, speaks as the most active and certain of the emmenagogues. He obtained his knowledge of it from a country practitioner, who made it the subject of his thesis as a candidate for the doctorate at the medical school where Eberle then held the chair of practice. The late Prof. M. B. Wright, of Cincinnati, held it in equal estimation, and during his long career prescribed it often with success. It has very decided stimulant, even vesicating property, when rubbed into the skin, whence its common name, *smartweed*. The form most convenient for its administration is the fluid extract, given from 5 to 30 minims, three or four times a day; mixed with some glycerin or wine it can be readily taken. The activity of this drug is due probably to the presence of polygonic acid, which was isolated by Dr. C. J. Rademaker from Polygonum hydropiper, *Lin.*—(See *Amer. Jour. Phar.* 1871, p. 490.)

Megarrhiza californica, Torrey.—The root of this cucurbitaceous plant has been examined by J. P. Heaney (see "Amer. Jour. Phar.," 1876, p. 451). The bitter glucoside megarrhizin seems to have been recently obtained in a much purer state by Wilfred M. Young; its decomposition product now named *megarrhizein* was prepared in white feathery crystals, soluble in hot water, alcohol and chloroform, insoluble in ether and cold water; it is purgative in doses of ¼ grain.

Young found also a second glucoside *megarrhin* which resembles saponin and possesses the property of dilating the pupils; also two resins, one soluble in alcohol the other soluble in ether.—*Proc. Cal. Coll. Phar.*, 1883, p. 52.

A bitter bark from San Salvador, of unknown origin, and for which febrifuge and tonic properties are claimed, has been described by Robert L. Ball. It is the inner bark and consists of quills or curved pieces, 3 to 12 inches long, ½ to 1 or 2 inches wide and 2 to 4 lines thick, of a blackish-brown color externally, somewhat lighter inter-

nally, small portions of the outer bark still adhering. Its taste is sweetish, then persistently bitter and astringent. On mastication it is found to be gritty and tinges the saliva red. It is inodorous, has a short fibrous fracture, and shows upon the resinous cross section numerous resin cells and numerous shining specks which proved to be crystals of calcium oxalate. A chemical examination proved the presence of 6 per cent. of resin, soluble in alcohol, red coloring matter and other common constituents, but failed to reveal the presence of an alkaloid. The ash amounted to 8 per cent.—*Ibid*, p. 51.

Andromeda japonica, Thunberg.—A poisonous principle, named *andromedin*, has been isolated from this plant by P. C. Plugge; it is resinous, nearly insoluble in petroleum-benzin, absolute ether and carbon bisulphide, slightly soluble in benzol, glycerin and oil of turpentine, soluble in water, and freely soluble in chloroform, alcohol, amyl-alcohol, glacial acetic acid and alkalies; its aqueous solution has a faint acid reaction, and is not precipitated by lead acetate or subacetate. —*Archiv d. Phar.*, 1883, Jan., p. 1–16.

Probably the same principle, which, however, yields a flocculent precipitate with lead subacetate, has been named *asebotoxin* by J. F. Eijkman, and is obtained by agitating the concentrated aqueous infusion of the plant with chloroform, precipitating the chloroformic solution with petroleum-benzin, and purifying the precipitate by dissolving in alcoholic ether, agitating with water and evaporating the latter solution. Asebotoxin is colorless, glass-like, soft at 100° C., melts at 120°, is freely soluble in warm water, in alcohol, chloroform and amylic alcohol, and less freely soluble in potassa solution than in ammonia and pure acetic acid. It is slightly soluble in pure ether, and almost insoluble in benzol, petroleum-benzin and carbon bisulphide. The aqueous solution has a neutral reaction, and is not precipitated by ferric chloride, cupric sulphate, mercuric chloride, auric chloride, argentic nitrate or plumbic acetate. When boiled with diluted hydrochloric acid, a resinous body separates and the filtrate yields, with alkaline copper solution, a copious precipitate of cuprous hydrate. Asebotoxin acquires a beautiful blue color when moistened with hydrochloric acid, the color changing to violet-red when heated in a water-bath. Diluted sulphuric acid colors it red, changing to rose color, at the same time separating a blueish-gray substance. The lethal dose for rabbits is ·003 gm. of asebotoxin or an infusion of ·2 gm. of the leaves.—*Chem. Centralbl.*, 1883, p. 72; *Phar. Weekblad*, Oct. 1, 1882.

The leaves of Andromeda mariana, *Lin.*, known as stagger-bush, of Kalmia angustifolia, *Lin.*, known as lamb-kill, and of several allied American species, are reported to be poisonous, and may contain a principle identical with or allied to the foregoing.

Analysis of Cinchona leaves.—Emil Happersberger has determined the amount of alkaloids contained in the leaves of four species of cinchona grown in the University grounds at Berkeley, Cal., which is declared to be a most unfavorable locality for the cultivation of the plant. The results were as follows:

Process.	Cinchona Calisaya.			Entire leaf.		
	Lamina without midrib.	Entire leaf.	Midrib.	C. succirubra.	C. officinalis	Hybrid.
Br. Phar.	·70	2·0	3·2	1·5	·50	·75
Muter's.	·76	2·0	4·0	1·8	·66	·70

The alkaloids of calisaya leaves were separated, and consisted of quinine, quinidine, cinchonine, and cinchonidine, of which quinidine comprised about one-half of the whole. If these leaves are a fair representation of cinchona leaves generally they must possess considerable medicinal value.—*Proc. Cal. Coll. Phar.*, 1883, p. 53.

Oil of Gaultheria.—Wm. P. Underhill has distilled this oil since 1874, and gives the average yield as 10 pounds from a ton of the leaves, the highest yield being 14, and the lowest 9 pounds of oil. The larger yield is obtained when the season is dry. The cost of the leaves delivered at the mill is 1½ cents per pound, and it is very difficult to obtain leaves at that price. Since it will require about 200 pounds of leaves to make one pound of oil, the cost of the latter is $3.00 for the leaves alone. The author does not believe that the large sleazy leaves of New Jersey yield more oil than the stiff, hard, and brittle leaves of New Hampshire.—*Proc. N. H. Phar. Assoc.*, 1882, p. 34.

Blue volatile oils.—On the fractional distillation of the volatile oils of German chamomile, wormwood and yarrow, Carl Hock obtained the first fractions colorless; those obtained above 150° C. were greenish, or blue-green, and those passing over at and above 260° C. were intensely blue. A considerable quantity of blue distillate was also obtained from the oil of elecampane. It is known that on the dry distillation of galbanum, a blue oil is produced. A. Kachler (1876),

reported on a blue oil from the so-called aromatic Peruvian guaiac resin, and on blue fractions from oil of valerian; and Flückiger ("Phar. Chemie," p. 309) on blue oils from sumbul, puchury, patchouly and asafœtida. Hock finds that all these blue oils show in the spectroscope three absorption bands in red and orange; they distil at 260° C. and give a colorless vapor, not blue as was stated by Kachler (1871), for oils of galbanum and German chamomile. Though the blue compound seems to pre-exist occasionally in the plant, Hock regards it as being mostly produced by decomposition at an elevated temperature. Old resinified oils were found to yield a larger amount of the blue product, which, in contact with air is easily altered, turning to dingy brown.—*Archiv d. Phar.*, Jan. 1883, pp. 17, 18.

Composition of Cacao Butter.—Kingzett announced in 1877 the isolation of two fatty acids having the melting points 57° and 72°C.; the latter was named theobromic acid, and was stated to have the formula, $C_{64}H_{128}O_2$. Vander Becke in 1880 endeavored to prepare the latter, but without success. The subject was recently investigated by M. C. Traub, who examined five samples of oil of theobroma, two of which had been prepared by himself. After saponification the acids were ascertained to be completely precipitated by magnesium acetate, and by repeated fractional precipitation it was proven that the oil consists of the glyceryl esters of oleic, lauric, palmitic, stearic and arachic acids, and that the solid consistence of the oil and its low melting point are most likely due to, the peculiar proportions in which these compounds are combined resembling in this respect the behavior of certain metals.—*Archiv d. Phar.*, Jan., 1883, pp. 19—23.

Free Acids in Vegetable Fats.—Ernst Schmidt and H. Roemer obtained from *cocculus indicus* 23·6 per cent. fat, of which 39 per cent. (9·2 per cent. of the fruit) proved to be stearic acid, which was obtained by dissolving the oil in hot alcohol, precipitating with barium acetate, exhausting the precipitate with petroleum benzin, and decomposing the barium salt with hydrochloric acid.

By fractional distillation, *in vacuo*, of commercial expressed *oil of nutmegs* myristic and stearic acids were obtained, amounting to 3 or 4 per cent., the last-named acid being present in small quantity.

A very small proportion of free acid is contained in *laurel oil*, the expressed fat of the fruit of Laurus nobilis; but by exhausting the fruit with hot alcohol 2 to 3 per cent. of fatty acid was obtained,

which proved to be a mixture of several acids not yet identified, but possibly containing palmitic acid.—*Ibid.*, pp. 34—38.

Convallaria majalis has recently been recommended as a substitute for digitalis in regulating the frequency and rhythm of the heart-beats, increasing the strength of the contractions and raising the blood pressure, and as being free from the cumulative action of digitalis. Dr. B. Stiller has used the drug in twenty-one cases, of which seventeen gave absolutely negative results, showing not the least influence on the frequency or rhythm of the heart's action; two individuals experienced a certain degree of diuretic effect without any of the other vaunted phemomena, not even the dropsy being diminished; only two patients underwent decided improvement in most of the cardiac symptoms during the use of the new medicine; but these cannot outweigh the large balance of negative results.—*Boston Med. and Surg. Jour.*, Feb. 22, 1883; *Wiener Med. Woch.*

VARIETIES.

WILLOW LEAVES IN AGUE.—The "Lancet" says that an Indian surgeon, Chetan Shah by name, has recently revived the use of willow leaves in intermittent fever. This is an old remedy, now almost forgotten in Europe, while the leaves of several species of willow are still largely prescribed by hakims of India and Afghanistan, especially in the form of a distillate. Among the lower classes of Cabul, and especially in women, quinine was found to irritate the bowels, while the juice of the fresh willow leaves, largely diluted with water, rarely failed to cure intermittent fever. In pregnant women the willow leaf is almost always found preferable to quinine.—*Med. and Surg. Reporter.*

THE ACTION OF QUASSIN.—Dr. Comparden finds that quassin, the active principle of Quassia amara, in moderate dose, produces an increase in the salivary, hepatic and renal secretions, and acts as a stimulant to the muscular fibre of organic life. In doses of 15 milligrams to 15 centigrams, it causes in man a burning pain in the œsophagus, headache, nausea, vertigo, dimness of vision, vomiting and diarrhœa, and cramps of the muscles of the leg. These symptoms are removed by chloral or chloroform.—*Bull. Gén. de Thér.—Phila. Med. News.*

DEATH FROM DICHLORIDE OF ETHIDENE.—The "Lancet," Jauuary 27, 1883, records the death of a man who was anæsthetized with the above agent. Nitrite of amyl, and artificial respiration for an hour, were useless. The heart was flabby, thin and extensively degenerated; the valves were healthy.—*Med. and Surg. Reporter*, March 17.

CHLORATE OF POTASSIUM in fine powder has yielded excellent results when dusted on to the surface of ulcers and ulcerating epitheliomata. The surface should be cleansed and the powder dusted thickly on, and twice a day. It relieves pain and promotes healing by changing the character of the morbid processes.—*Weekly Med. Review*, March 3d.

POWDERED CAPSICUM as a remedy in sub-acute and chronic rheumatism has been recommended by Mr. A. Drummond MacDonald in the "British Medical Journal." Two drachms to the ounce of lard, to which one of the essential oils may be added to make it more elegant, is the proportion mentioned. It is to be thoroughly rubbed over the affected part by a gloved hand for ten minutes at a time, night and morning, or at bed time only, according to the effect produced. Dry heat applied afterwards intensifies its effect, which lasts for some time.—*Weekly Med. Review*, March 3, 1883.

FERROCYANIC PELLETS, made of sodic ferrocyanide and citric acid, are recommended by Dr. F. W. Pavy ("British Medical Journal") as a clinical test for albumen. The advantages they possess are that they are very soluble, are always ready for use, simply requiring to be crushed, which can readily be done with a coin from one's pocket, and requiring no heat. The test, he says, is so delicate that even when there is only a small amount of albumen present it is easily recognized. After crushing, the powder is put into a test-tube and the urine poured in to the height of about an inch, which will be all that is required Phosphates, he says, do not interfere with the reaction, but if lithates are present, giving the urine a cloudy appearance, it must first be warmed. They can also be used after the manner of the nitric-acid test, by first dissolving the pellet in a little water and then allowing the urine to trickle down the side of the tube until a quantity about half an inch in height has been introduced, when the albumen will be more clearly shown than with the nitric acid.—*Weekly Med. Review*, March 3, 1883.

NAPHTHALIN AS AN ANTISEPTIC.—From an article in the *Am. Jour. Med. Sci.*, we learn that naphthalin is available for all the purposes to which iodoform has been applied, and as yet no constitutional effects have been observed to follow its use locally. It is as powerful an antiseptic and "antibacteric" as iodoform, and has a less disagreeable [?] smell. Its application causes a slight transitory sensation of heat, but no pain. Anschütz states that very sensitive granulations sometimes bleed rather freely after it has been applied, owing to the sharp angles of the hard crystals. This can be obviated by using it in fine powder, though if there is much discharge it is then apt to form a crust on the surface of the granulations. When the crystalline form is used the discharges escape freely.—*Med. and Surg. Reporter*, March 10, 1883.

ASTHMA CIGARETTES.—Impregnate well nitred paper with an alcoholic fluid extract of grindelia; let dry and use in cigarettes. Owing to the nitre they will continue to glow and develop.—*Medical Record. N. Car. Med. Jour.*, Jan., 1883.

MINUTES OF THE COLLEGE.

PHILADELPHIA, March 26, 1883.

The annual meeting of the Philadelphia College of Pharmacy was held at the College Hall this day. Dillwyn Parrish, President, in the chair. 22 members in attendance.

The minutes of the last meeting were read, and, on motion, adopted.

The minutes of the Board of Trustees since December last were read by Thomas S. Wiegand, and, on motion, approved.

Thomas S. Wiegand, librarian, made the following report:

PHILADELPHIA, March 26, 1883.

The librarian respectfully reports that the usual number of exchanges have been bound and added to the library, as also the "Journal" of the London Chemical Society, of the Botanical Society, and the "Chemical News." The theses for the year 1881 have also been bound. The Library Committee have purchased a number of valuable pharmaceutical, chemical and technical works, which also have been added to our list. All of which is respectfully submitted. T. S. WIEGAND.

Joseph P. Remington, curator, made a verbal report, in which he stated that the Museum remained in about the same state and condition as last year, he having not had time to give the matter as much attention as its importance demanded.

He called attention to the necessity of having a considerable amount of work done during the ensuing year, and as there was a large amount of material to be placed in a suitable condition for exhibition, he recommended the election of some one else as curator who could give the matter the requisite attention.

Henry N. Rittenhouse, Chairman of the Publishing Committee, read the following report, which was, on motion, adopted:

PHILADELPHIA, March 26, 1883.

To the Members of the Philadelphia College of Pharmacy:

Gentlemen.—The Publishing Committee respectfully submit their annual report that the JOURNAL has been issued with its usual regularity, and its character, as a record of the condition and progress of Pharmacy and its allied sciences carefully maintained.

We recognize the vast amount of pharmaceutical literature that is now in the hands of the profession all over the country, yet we think that for the purpose for which the JOURNAL was originally established, and is still conducted, it fully maintains its distinctive character and usefulness.

The detailed reports of the Editor and Treasurer which accompany this will give the work of each department.

HENRY N. RITTENHOUSE, *Chairman.*

John M. Maisch, Editor, read his report for the year, showing the number of those who have in various ways contributed their share towards making the JOURNAL an interesting and valuable medium for the dissemination of chemical and pharmaceutical science. On motion, the report was approved.

To the Philadelphia College of Pharmacy:

The editor respectfully reports that during the past year ending with the present month, there have been published in the JOURNAL 57 original papers, of which number 29 were on strictly pharmaceutical subjects, while one-half of the remaining number related to pharmaceutical chemistry and the other half to materia medica. This number includes several short

notes, but does not include editorials, original translations and those condensed abstracts of scientific literature which have been published under four different titles, and of which Prof. Sadtler contributed 2, Prof. Power 8, and the editor 17 papers. Of the original articles 13 emanated from active members of the College, 14 were abstracts of theses and 11 had been read at the pharmaceutical meetings, namely, 6 papers from 5 members of the College, 2 from students of the last class, 2 from graduates and one from a foreign pharmacist, the latter having been written at the request of a member of this College.

The contributors of original papers, who are not members of the College, numbered 21 during the past and the preceding year, 17 in 1881, and 25 in the year ending March, 1880, while during the last year only 7 members wrote for the JOURNAL. This the editor regrets to state is a very large falling off as compared with previous years; for during the preceding seven years the smallest number was 12 twice, 13 once and 16 for each of the remaining four years.

From the records kept by the editor and annually reported to the College, it becomes evident that pharmaceutical literary productions are very appreciably influenced by external stimulation; for during the years immediately preceding and following the Centennial Exposition in 1876 the number of contributors, of original contributions, of papers read at the pharmaceutical meetings, of College members writing for the JOURNAL and (except 1882) of theses suitable for publishing abstracts were larger than at other times. The new Pharmacopœia recently published would seem to furnish ample opportunity for critical experiments, and in addition thereto the editor would respectfully urge as he has done for a number of years past, the importance of fostering the pharmaceutical meetings, as well as original research in the chemical, and if it can be arranged, also in the pharmaceutical laboratory. JOHN M. MAISCH, *Editor.*

Charles Bullock, Chairman of the Committee to revise the list of Honorary and Corresponding Members, reported progress. The committee was continued.

A letter from J. A. Schiedt, of Philadelphia, tendering his resignation as a member of the College was read, and, on motion, accepted.

The Treasurer reported four members as being five years in arrears to the College. A motion was made and adopted that in accordance with previous custom, their names be stricken from the roll of members.

This being the annual meeting, an election was ordered by the President, who appointed Messrs. Henry Trimble and J. W. Worthington tellers, who, upon taking a ballot, reported the following officers, trustees and standing committees elected for the ensuing year.

President.—Dillwyn Parrish.

1st Vice President.—Charles Bullock.

2d Vice President.—Robert Shoemaker.

Treasurer.—Samuel S. Bunting.

Recording Secretary.—William J. Jenks.

Corresponding Secretary.—Alfred B. Taylor.

Board of Trustees (for three years).—John M. Maisch, Samuel P. Sadtler, Robert England. Term expires March, 1886.

Publication Committee.—John M. Maisch, Henry N. Rittenhouse, Thomas S. Wiegand, James T. Shinn, Charles Bullock.

Editor.—John M. Maisch.

Librarian.—Thomas S. Wiegand.

Curator.—C. Frederick Zeller.

There being no further business, then, on motion, adjourned.

WILLIAM J. JENKS, *Secretary.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, March 20, 1883.

In the absence of the President, Mr. Alonzo Robbins was called to the chair. The minutes of the preceding meeting were read and approved.

The following donations to the library were made: "United States Dispensatory," third edition, from Mr. Harold B. Miller, and the fifteenth of the same work, revised by Professors Wood, Remington and Sadtler, from the editors; also the third edition of the "Manual of Chemical Analysis as Applied to the Examination of Medicinal Chemicals," by Dr. F. Hoffmann and Professor F. B. Power, from the authors; and a copy of the Report of the Superintendent of Public Instruction. These were accepted with thanks.

The committee appointed at last meeting upon the formulas for unguentum hydrargyri nitratis and for tincture of iodine reported progress, and read a letter from Mr. Heinitsh, stating that the formula for the first named preparation yielded an ointment which was not affected by iron, but that no special advantage could be noticed in the change proposed for the tincture. The committee was continued.

The following papers were read: On the Fluid Extracts of the New Pharmacopœia, by Mr. Alonzo Robbins; Note on Milk Analysis, by Henry Trimble; and On the Preparation of Hydrobromic Acid, by Thomas S. Wiegand.

In regard to the examination of milk, Professor Maisch stated that the specific gravity alone afforded no criterion as to its purity, inasmuch as skim milk was heavier, and, by diluting it with 20 or 25 per cent. of water, mixtures could be obtained having the same density as pure milk. Lactometers based upon determining the opacity of milk, or the amount of cream or of butter yielded by it, gave more reliable results.

It was suggested to request Mr. Gustavus Pile to exhibit and explain the lactometers of his make at the next Pharmaceutical meeting.

Referring to the omission of processes for chemicals from the Pharmacopœia, Professor Maisch said that the object was not to drive the manufacture into the chemists' hands, but to leave the choice of the process altogether optional, provided only that the result would come up to the standard of purity adopted. Attention being called to the introduction of saccharated pepsin without a process, it was stated that the tests were deemed to be ample for securing a uniform product, without making hog's stomach officinal, from which the pepsin is to be prepared.

A specimen of oil of anise which had solidified was exhibited, and it was queried whether it was genuine. It was explained that it was oil of staranise.

Dr. Wolff alluded to the specific gravity of oleic acid as given in the Pharmacopœia being different from the authorities he had consulted and his own determinations.

On motion adjourned.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

PHILADELPHIA COLLEGE OF PHARMACY.—The examination of the students of the *Junior* class was held on Thursday, February 15. In the forenoon each student was required to prepare a quantity of granulated citrate of potassium, and to percolate four troy ounces of ground glycyrrhiza with a menstruum made by mixing half a fluidounce of water of ammonia with twelve fluidounces of water. In the afternoon the written examinations took place, the questions being as follows:

PHARMACY.

1. How many *grains* are there in a *kilogramme*, *decigramme*, and *cubic centimeter* of water at 4°C?
2. Define *Percolation* and *Repercolation*, and illustrate the practical application of the latter in making twelve pints of a fluid extract.
3. What are *Fluid Extracts?* How do they differ in strength from those formerly officinal? What is an *Extract?* What is an *Abstract?*
4. Define a *Pharmaceutical Syrup*. Describe three methods of making *Syrups*, and give an example of each method showing why you would prefer to use the particular method in the example that you have chosen.
5. What is the process of *Crystallization?* Describe three methods of producing crystals. Define *Dialysis*.

BOTANY AND MATERIA MEDICA.

1. Describe, in a general way, the cells composing *fibro-vascular bundles*, and the arrangement of these bundles in the stems of *Dicotyledons* and *Monocotyledons*.
2. Define the terms *Tree*, *Shrub*, and *Annual*, *Biennial* and *Perennial Herb*. Give an example of each.
3. What is the fruit of the *Graminaceæ* called, and which of its tissues contains starch?
4. Give the botanical name and habitat of *Boneset*. Describe the drug and give its medicinal properties.
5. Give the botanical characters of *Ranunculaceæ*, and name three drugs derived from this natural order.

CHEMISTRY.

1. How do we explain the fact that heat is necessary to change ice at 0°C. into water at 0°C., or water at 100°C. into steam at 100°C.? Give an example of another liquid that produces cold by evaporation. Mention some practical applications of this principle. How is the same principle made use of in freezing mixtures?
2. What is a *Simple Magnet?* What is an *Electro-magnet?* What difference is there in their action? Of what different materials are they composed?
3. What is the proper chemical name of *Calx chlorata?* How is it made? What are its uses in pharmacy and in the arts?
4. Describe the commercial manufacture of *Sulphuric Acid*, and give the chemical reactions which take place in the course of the manufacture.
5. Describe the several varieties of *Phosphorus*, and mention the points of difference between them.

COMMITTEE.

1. What is the source of *Sulphur?* In what forms does it occur in commerce? Give the officinal process for the preparation of *Precipated Sulphur*. What impurity may the commercial article contain? What is this impurity, and how may it be detected?
2. What is understood by the *Specific Gravity* of a body? How would

you take the *Specific Gravity* of a liquid? Of a solid heavier than water? Of a solid lighter than water?

3. Describe the appearance of *Iodine*. Give the source from which it is usually obtained. What are its compounds with other elements called? Name a test for *free Iodine* in solution, and state the effect produced. When *Iodine* is united with *Oxygen* or *Hydrogen*, what acid is formed in each case?

4. What is the officinal name and natural order of *Chamomile?* What part of the plant is officinal? Describe the appearance of the drug; also give the officinal name and natural order of *German Chamomile?* State what part is officinal, and describe the appearance of the drug. What is the color of the volatile oils of these two chamomiles?

5. What is the object of the process of *Comminution?* State the five degrees of fineness of powder as directed by the United States Pharmacopœia of 1880, and give their corresponding numbers. What do these numbers indicate?

The following specimens were set out for recognition:

Rosa gallica, Extract. Ergotæ fluidum, Acidum boricum,
Lavandula, Syrupus Zingiberis, Potassii nitras,
Cetraria, Tinctura Gentianæ composita, Acid. hydrochloricum dilutum.
Mentha piperita.

The re-examination of those students who failed in one or more branches will be held on Friday afternoon, September 28th, at 3 o'clock, when also others will be examined under the rules of the College prior to entering the senior class.

The students of the *Senior* class were examined in materia medica on Tuesday afternoon, February 27th, the examination in the other branches being continued on the following days, and closing on Saturday with practical pharmacy. The following questions were asked:

QUESTIONS IN MATERIA MEDICA AND BOTANY.

A. Burdock root. Give the botanical name, natural order and habitat of the plant. Describe the root and its structural characteristics. Give its constituents, its medicinal properties and its dose. Briefly mention the distinguishing structural characters of the other officinal roots obtained from the same natural order.

B. Black Snake-root. What part of the plant is it? From what plant, natural order and country is it obtained? Describe the drug and its structural characters. Give its constituents, medicinal properties and dose.

C. What is *Savine?* Name the plant, its natural order and habitat. Describe the drug. Give its constituents, medicinal properties and dose. How may it be distinguished from red cedar and arbor vitæ?

D. Characterize the four principal *Cinchona alkaloids* (yielding crystallizable salts) according to their composition, behavior to solvents and to tests. How is the officinal amorphous cinchona alkaloid tested for the absence of resin and of alkaloidal and inorganic salts?

E. Jaborandi, Eucalyptus, Coca, and Boldo leaves. Give for each the botanical name, natural order and habitat of the plant, the important distinguishing characters and the principal constituents.

F. Fig. Name the plant, its natural order, habitat and the part used. Describe the drug. Give its medicinal properties. Enumerate its principal constituents. State what changes in the constituents take place during the ripening of the fig.

G. Name the plants, their natural order and habitat, and describe the physical properties and the structure of the two officinal *mustard seeds.* Name the important principles, and state the influence of water upon them. What effect has iodine upon the decoction after cooling?

H. What percentage of *morphine* is required to be contained in *opium*? In *opii pulvis*? In *opium denarcotisatum*? Give some color reactions for morphine. State its chemical relations to *codeine* and to *apomorphine*. What are the medicinal properties of the three alkaloids named? Give the outline of the process for the morphiometric assay of opium.

I. Balsam of Peru and *Balsam of Tolu.* Give for each the botanical name, natural order and habitat of the plant; also, in a brief manner, the mode of production, the characteristic properties, principal constituents and tests for purity.

K. Characterize the officinal *umbelliferous fruits* from the appearance of the commissure and according to the number and location of oil vessels. Name the officinal *umbelliferous gum-resins*, and give of each approximately the percentage of volatile oil, gum and resin. State which contain sulphuretted compounds, and from which country each gum-resin is obtained.

QUESTIONS IN PHARMACY.

A. Write the answers to the following in the blanks provided for the purpose, showing the method of obtaining the results: 1. How many cc. are there in a *pint* of distilled water at 4° C.? 2. How many milligrammes in $\frac{1}{64}$ of a grain? 3. How many *grains* in a *liter* of officinal Lactic acid? 4. How many *grammes* in a *kilo* of sugar? 5. How many *grains* in a *fluidounce* of glycerin?

B. Give the unabbreviated officinal names, ingredients, outlines of process, and state briefly what improvement over the U. S. P. 1870 process was made in the following U. S. P. 1880 preparations: *Fluid Extract of Ergot, Tincture of Nux Vomica, Solution of Chloride of Iron, Syrup of Senega, Cerate of Subacetate of Lead.*

C. Give the English names, medical uses and the ingredients used in the preparation of *Aqua Chlori, Glyceritum Vitelli, Liquor Iodi Compositus, Liquor Sodæ Chloratæ, Pulvis Glycyrrhizæ Compositus, Pulvis Morphinæ Compositus, Syrupus Pruni Virginianæ, Tinctura Arnicæ Florum, Oleoresina Aspidii, Vinum Ergotæ.*

D. Give the officinal name, quantities and ingredients for a troy ounce of the following U. S. P. 1880 preparations: Dover's Powder, Ointment, Oleate of Veratrine.

E. Give the U. S. P. 1880 name and formula for the wine which is directed as a menstruum for the officinal medicated wines. State and explain the objects of the officinal alcoholometrical test for white wine.

F. Give the tests for recognizing Quinine, Meconic Acid, Strychnine.

G. How is spirit of Nitrous Ether made? How does the officinal formula differ from that of U. S. P. 1870?

H. Give the officinal formulæ, with the quantities of the liquid preparations of opium. In what respect does the officinal definition of powdered opium differ from that of the U. S. P. 1870? What were the strengths of the liquid preparations of opium of the U. S. P. 1870?

I. Give the unabbreviated officinal names of four preparations of Glycyrrhiza of the U. S. P. 1880. What alkaline solution is used as an addition to the menstrua in three of the preparations? Why is it used? What compound is believed to be formed?

K. Describe three methods of making suppositories. What are the advantages and disadvantages of each method?

QUESTIONS IN CHEMISTRY.

A. What are the chief sources at present of potassium salts? What is the chemical composition of *Potashes*? What of *Argols*? What of *Saltpetre*? Give a description of these three salts when purified.

B. What is the chemical formula of the officinal *Sodii Phosphas*? What of *Calcii Phosphas Præcipitatus*? What of *Sodii Pyrophosphas*? What of *Sodii Hypophosphis*? What of *Calcii Hypophosphis*?

C. What is the difference between *Magnesia* and *Magnesia ponderosa*? From what materials are they made respectively?

D. Describe the metal *copper*. Mention some of the more important alloys into which it enters. What is the result of the action of sulphuric acid upon copper? What of the action of nitric acid upon copper? What of the action of aqua ammoniæ upon copper?

E. Give the exact chemical names and formulas of *Hydrargyrum chloridum corrosivum* and *Hydrargyrum chloridum mite*. State the points of difference between them. State the tests by which they may be distinguished. And how they may be separated when found together.

F. Give the chemical formula of *Plumbi Carbonas*. State how it is made ordinarily. And what are its uses in pharmacy and the arts? Give the chemical formula of *Plumbi Acetas*. And of the salt present in Goulard's extract.

G. What is a *compound ether?* Give one or more officinal compounds belonging to this class. For what purpose are the compound ethers mostly used?

H. Mention the several groups of *Carbohydrates*, giving their formulas. What simple relation exists between the formulas of these groups? Which of these groups is capable of fermentation? Show by reaction how the sugar formula is changed in this process? By what means are the compounds of the third group changed successively into the second group and the first group?

I. What is a *Phenol?* From what simpler compound is it derived chemically? Give the formulas of those phenols which are officinal.

K. How would you define an *alkaloid?* What are some of the reagents specially used in their detection and separation? Mention points of difference between an *alkaloid* and a *glucoside*. In what respect does the formula of the sulphate of an alkaloid differ from that of a metallic sulphate? Can you mention any alkaloids that have been made artificially?

QUESTIONS BY THE EXAMINING COMMITTEE.

A. Describe briefly the chemical changes which occur in the preparation of the officinal hard *Soap*. How may soap be separated from the residual liquids? What is soap chemically? Name an officinal example of a chemically analogous compound, with an earthy or metallic base. How may the quantity of fatty acids in Soap be ascertained. How may adulterations with earthy substances be detected? How may the presence of animal fats in Soap be proved? To what class of poisons is soap an antidote? Name three officinal preparations containing hard soap. What is the object of Soap as an ingredient in pills?

B. Give the botanical name, natural order and habitat of any *five monocotyledonous plants* which yield officinal drugs. Name the officinal portion and the important constituents of each.

C. What is the chemical composition of *Tartar Emetic*? How is it prepared? Name two officinal preparations into which it enters. What quantity of Tartar Emetic is contained in each? How would you distinguish Tartar Emetic from Bitartrate of Potassium? What is the dose of Tartar Emetic as an emetic?

D. What are the principle products of the *destructive distillation of wood?* What is the specific gravity of Acidum aceticum, U. S. P.? How much $HC_2H_3O_2$ does it contain in one hundred parts by weight? State how Potassii acetas is prepared, and show by an equation the chemical reaction that takes place.

E. Give the full officinal title of the following preparations. State their doses, name the part of the plant from which they are made, and give a general formula for their preparation: *Abstracts* of Aconite, Conium, Digitalis, Hyoscyamus, Ignatia, Jalap, Nux Vomica, Podophyllum, Senega, Valerian.

F. What is the officinal name of *Calabar Bean?* What plant furnishes Calabar Bean? To what natural order does this plant belong? Where is this plant indigenous? What two names have been given to the active principle? What menstruum is used in making the extract, and what is

the dose of this preparation? What proportion of the drug is represented in the Tincture, and what is its dose? What salt of the active principle is officinal? What is the therapeutic effect of Calabar Bean? Describe briefly the appearance of the Bean, and draw an outline of its shape.

G. Give the officinal name and definition of the following drugs. State the botanical name, natural order and habitat of the plants which furnish them, and name an officinal preparation into which each one enters: *Gum arabic, Tragacanth, Myrrh, Kino, Benzoin, Mastic.*

H. Give the botanical name, natural order and habitat of the plant which yields *Asafetida?* Describe the characteristics of the *natural order* to which this plant belongs. What is the process employed in obtaining the drug? Describe its appearance as found in commerce. What are its chief constituents, and to which one is its odor due? Why does it form an emulsion when rubbed with water? Name three officinal preparations into which Asafetida enters?

I. Give a process for making *Acidum Tannicum*, and explain the process. Show the chemical relation of Acidum Tannicum to Acidum Gallicum, and in what manner they differ in physical appearance. Into how many groups may Tannins be divided? Give the distinguishing test for the same, and name an officinal drug for each group. State to which group Acidum Tannicum belongs, and name the botanical origin of the drug yielding it, and how the drug is produced. Name two officinal preparations into which Acidum Tannicum enters. What is its chief medical property?

K.

1.

℞ Tincturæ Myrrhæ, . . f℥ii
Aquæ Rosæ, . . . f℥iv
.....
Fiat Mistura.
Signa. To be used as a gargle.

Write on the blank line the full officinal name and proper quantity of the substance necessary to form a permanent mixture.

2.

℞ Physostigminæ Salicylatis, gr. xx
Extracti Colocynth. Comp., ℈i
Cinchoninæ Sulphatis, . ℈i
M. ft. Pil x.
Signa. One to be taken every two hours.

Criticise this prescription. Would you dispense it?

3.

Write a formula in unabbreviated Latin for 8½ troyounces of Basham's Mixture, and give the officinal title.

℞ Tincture of Chloride of Iron, . . . 2 parts
Diluted Acetic Acid, 3 parts
Solution of Acetate of Ammonium, . 20 parts
Elixir of Orange, . 10 parts
Syrup, . . . 15 parts
Water, . . . 50 parts
Mix.

4.

Write a formula in unabbreviated Latin for 8½ ounces troy of Dewees' Mixture, and give the officinal title.

℞ Carbonate of Magnesium, 5 parts
Tincture of Asafetida, 7 parts
Tincture of Opium, . 1 part
Sugar, ... 10 parts
Distilled water, a sufficient quantity to make . 100 parts
Mix.

The specimens selected for recognition were as follows:

Materia Medica.	Pharmacy.	Chemistry.	Examining Committee.
Althæa,	Pulv. Rhei compositus,	Acidum Boricum.	Uva ursi,
Serpentaria,	Aqua destillata,	Potassii Bicarbonas,	Carum,
Gossypii Rad. Cort.	Aqua Fœniculi,	Sodii Hyposulphis,	Lycopodium,
Salix,	Syrupus Picis liquidæ,	Sodii Acetas,	Pulv. Rhei compositus,
Hæmatoxylon,	Syrupus Krameriæ,	Magnesii Sulphas,	Ceratum Resinæ,
Chondrus,	Extract. Sennæ fluidum.	Alumen,	Tinctura Myrrhæ,
Illicium,	Extract. Glycyrrhizæ purum,	Alcohol,	Acetum Scillæ,
Nux vomica,	Mist. Ferri et Ammon. Acetat.,	Æther Acetius,	Mist. Ferri et Ammon. Acet.,
Galla,	Massa Ferri Carbonatis.	Acidum Salicylicum,	Ferri Sulphas exsiccatus,
Benzoinum,	Ceratum.	Acidum Gallicum,	Spirit. Ætheris Nitrosi.

The practical work for each candidate consisted in the dispensing of eight powders, the preparation of fifty Pilulæ Phosphori, the preparation of Unguentum Hydrargyri Nitratis, the spreading of a warming plaster, and the preparation of Liquor Ferri Tersulphatis.

The following 153 candidates passed the examination, and were recommended to the Board of Trustees for the degree of Graduate in Pharmacy.

E. Floyd Allen, Pennsylvania, *Oleum Gossypii Seminum.*
Charles Howard Andrews, New York, *Elaterium.*
Milton Shimer Apple, Pennsylvania, *Glechoma.*
William Charles Armbrecht, West Virginia, *Essentials of a Pharmacist.*
Charles Frederick Arnold, Iowa, *Parts by Weight and Parts by Measure.*
Edward Everett Bagge, New Jersey, *Chimaphila Umbellata.*
Charles Henry Baker, New Jersey, *Toxicology.*
Allen D. B. Ballentine, Pennsylvania, *Coccus Cacti.*
John Henry Balmer, Pennsylvania, *Xanthoxylon.*
William Henry Barr, Jr., Wisconsin, *Anæsthetics.*
Charles Benjamin Baumgardner, Pennsylvania, *Pills and Excipients.*
William Henry Bellis, New Jersey, *Heat in Percolation.*
Samuel Neuman Benjamin, New Jersey, *Iris Versicolor.*
Stephen Conklin Bolton, New York, *Boroglyceride.*
Henry Augustus Boorse, Pennsylvania, *Pill Excipients.*
Frederick Smith Booth, Pennsylvania, *Oleum Morrhuæ.*
Evan Garrett Boyd, Delaware, *Rhus Toxicodendron.*
Joseph Henry Brown, Illinois, *Salicylic Acid.*
Robert Craighead Browning, Indiana, *Spiritus Ætheris Nitrosi.*
Byron Edwin Bruenchenheim, Wisconsin, *Cambogia.*
George White Butler, Pennsylvania, *Pepsin.*
Milton Campbell, Maryland, *Improved Syrup of Wild Cherry.*
Matthew Venable Cheatham, Texas, *Xanthium Strumarium.*
John Houston McIntosh Clinch, Georgia, *Ceanothus Americanus.*
Walter Howard Cline, New Jersey, *Plants and Minerals.*
Edward Nelson Cole, Ohio, *Glycerin.*
Mimms William Coleman, Alabama, *Tinctura Ferri Chloridi.*
John William Cook, Maryland, *Extractum Cannabis Indicæ.*
Clark Rankin Craig, Pennsylvania, *Commercial Arsenic.*
Albert Douglas Cuskaden, Pennsylvania, *Emulsions.*
Nathan Alexis Cozens, New Jersey, *Alcohol.*
John Daly, New Jersey, *Oleum Picis Liquidæ.*
John Henry Dare, New Jersey, *The Pharmacist.*
Harry Irvin Davis, Pennsylvania, *Water.*
William Henson Davis, Pennsylvania, *Cinchona.*
Harry Harttup Deakyne, Delaware, *Boric Acid.*
Howard Dickson Dietrich, Pennsylvania, *Hydrarygri Chloridum Mite.*
Roger William Duffey, Maryland, *Alcohol.*
Milton Jacob Dundor, Pennsylvania, *Citrine Ointment.*
Frederick Rudolph Eilinger, New York, *Emulsions with Acacia.*
Joseph Winters England, Pennsylvania, *Cheken.*
John Riley Esenwein, Pennsylvania, *Syrupus Theobromæ.*
Harry Buckley Fasig, Pennsylvania, *Absorbent Cotton.*
Edgar Burnside Fell, Delaware, *Extractum Pruni Virginianæ Fluidum.*
Frank Byerly Fleming, Pennsylvania, *Tinctura Vanillæ.*
Daniel William Flemming, Pennsylvania, *Balsamum Peruvianum.*
William Charles Franciscus, Pennsylvania, *Analysis of Liquor Potassii Arsenitis.*
John Frederick Frangkiser, Ohio, *Hamamelis Virginica.*
John Peter Frey, Indiana, *Canella Alba.*
John William Frey, Pennsylvania, *Acetic Acid.*
Charles Joseph Valentine Fries, Pennsylvania, *Chemistry of Volatile Oils.*
William Bomgardner Gleim, Pennsylvania, *Trifolium Pratense.*
Harry Jonas Tilghman Good, Pennsylvania, *Emulsions with Gelatin.*
Harry Tilford Gray, Illinois, *Sugars.*
Henry Hamilton Gregg, Jr., Ohio, *Nitric Acid.*
Samuel Stratton Guest, New Jersey, *Gelatin.*
Gustave Hahn, Wisconsin, *Hops.*

Charles Wesley Hallowell, Pennsylvania, *Cascara Sagrada.*
William T. Hanigan, Pennsylvania, *Growth of Pharmacy.*
Owen Burdette Hannon, New York, *Gaylussacia Resinosa.*
Frank Pierce Harris, Pennsylvania, *Rhamnus Purshiana.*
James Oliver Harrison, Maryland, *Crystallography.*
Susan Hayhurst, Pennsylvania, *Pharmaceutic Manipulations.*
Thomas Jerdone Haynes, Delaware, *Pills.*
John Clement Heisler, Pennsylvania, *Separation of Iodide from Bromide of Potassium.*
Charles Frederick Gustav Helm, Pennsylvania, *Citrate of Magnesium.*
John Marshall Horsey, South Carolina, *Fluid Extract of Wild Cherry.*
Daniel R. Jones, Wisconsin, *Commercial Pepsin.*
Henry Morford Jones, Kentucky, *Chemistry.*
James Miles Jones, Pennsylvania, *Comptonia Asplenifolia.*
Theodore Milton Johnson, Indiana, *Pills and Excipients.*
William Frederick Jungkunz, Illinois, *Granatum.*
Henry George Kalmbach, Pennsylvania, *Aconite and its Alkaloids.*
Emil Frank Kempfer, Wisconsin, *Cubeba.*
Heber Ker, Jr., Virginia, *Mineral Acids.*
Frank Gault Kerr, Missouri, *Carbonic Acid Water.*
William D'Olier Kerr, Pennsylvania, *Pharmaceutic Etiquette.*
John Cathcart Keys, Pennsylvania, *Laws Relating to Drops.*
Rudolph Kindig, Switzerland, *Eriodictyon Californicum.*
James Edgar Kirk, Delaware, *Syrupus Sennæ.*
Horace Thompson Kline, Pennsylvania, *Practical Hints.*
John Harrison Klingler, Jr., Delaware, *Chemical Salts.*
James Delaplaine Krider, Pennsylvania' *Calabar Bean.*
William Reif Lacy, Pennsylvania, *Glycyrrhizæ Radix.*
Frederick Charles Lehman, Pennsylvania, *Efflorescence of Salts.*
Louis Charles Leonhard, Ohio, *Podophyllum Peltatum.*
William Wirt Light, Illinois, *Opuntia Vulgaris.*
Whitmel Horne Macnair, North Carolina, *Viburnum Prunifolium.*
Robert McCreight, Pennsylvania, *Alkaloids.*
William Worrell Maddock, New Jersey, *Pilulæ.*
Thomas Chew Marshall, Pennsylvania, *Ergot and its Preparations.*
Bernard Michel, Iowa, *Commercial Liquid Malt.*
Ewald Gustav Fred Miekley, Iowa, *Pharmacy.*
Harold Baughman Miller, Pennsylvania, *Pulvis Effervescens Compositus.*
Turner Ashby Miller, Virginia, *Tincture of Opium.*
Thomas Newman Milliken, Jr., Delaware, *Sodio-Citrate of Bismuth.*
James Moffet, Jr., Pennsylvania, *Hamamelis Virginica*
Horace Moll, Pennsylvania, *Syrupus Pruni Virginianæ.*
Malcolm Murray, Pennsylvania, *Humulus.*
Lawrence Augustus Neuhart, Ohio, *Cimicifuga.*
Alfred Black Norcross, New Jersey, *Miscibility of Powders.*
Christopher O'Brien, Pennsylvania, *New and Old Pharmacopœias.*
John Ogden, New Jersey, *Glyceryl Borate.*
Charles William Ott, Pennsyvania, *Mitchella Repens.*
Thomas Pleasant Parish, Virginia, *Cinchona Flava.*
I. Spencer Phillips, Pennsylvania, *Viburnum Prunifolium.*
Jacques Voorhees Quick, New Jersey, *Syrup.*
George Foster Ralston, Pennsylvania, *Preparations of Quebracho.*
Charles Fitz Randolph, Pennsylvania, *Examination of Sugar for Glucose.*
Benedict Nicholas Rapp, New Jersey, *Phosphorus.*
Charles Sumner Reed, New Jersey, *Salicornia.*
John Wesley Reeser, Pennsylvania, *Camphor.*
Charles Wolf Reichard, Pennsylvania, *Unguentum Hydrargyri Nitratis.*
Harry Knox Richardson, New Jersey, *Oleum Erigerontis.*
Charles Frank Rickey, Illinois, *Our Ph. G's.*
William Ruthrauff Roedel, Pennsylvania, *Efflorescence of Salts.*
George Frederick Roehrig, Pennsylvania, *Unguentum Hydrargyri Nitratis.*

Frank Randall Rohrman, Pennsylvania, *Characteristics of Pharmacy.*
William Augustus Ruth, Ohio, *Queen of the Meadow.*
George Washington Salot, Iowa, *Dispensing Medicines.*
William Edward Saunders, Canada, *Insects Injurious to Drugs.*
Gustav Scherling, Iowa, *Cosmoline.*
Charles Schindler, Ohio, *Confections.*
James Samuel Scheffler, Pennsylvania, *Glycerin.*
Daniel Schramm, Jr., Pennsylvania, *Chloral.*
Flor. Joseph Schmidt, Indiana, *Specific Gravity.*
Andrew Jackson Seeler, Pennsylvania, *Viburnum.*
Albert Tobias Sellers, Pennsylvania, *Manipulations.*
Robert Simpson, Pennsylvania, *Creosote.*
Charles Michael Smith, Pennsylvania, *Ipecacuanha.*
Stephen Douglass Smith, Pennsylvania, *The Drug Apprentice.*
Lewis Reed Souder, New Jersey, *Successful Pharmacy.*
William Bayne Spence, Pennsylvania, *Manufacture of Olein.*
Frank Hernlie Steacy, Pennsylvania, *Jacaranda Caroba.*
James Buchanan Stoner, Pennsylvania, *Cinchona.*
Nehemiah Dunham Streeter, New Jersey, *Preparation of Syrups.*
Anton Swaberter Tatzel, Pennsylvania, *Advantages of the Metric System.*
Samuel Henry Titus, New Jersey, *Proprietary Medicines.*
Alva Forman Tod, New Jersey, *Sulphuric Acid.*
Charles Lawrence Trusler, Indiana, *Principle in Quillaia Bark.*
George Allen Walker, New Jersey, *Adulterations.*
William Henry Walter, Pennsylvansa, *Digitalis Purpurea.*
George Washington, Weber, New Jersey, *Boric Acid.*
Morris Ellsworth Weber, Pennsylvania, *Glycerin.*
Reinhard Julius Weber, Pennsylvania, *Luffa Egyptiaca.*
John Wesley Weir, Jr., Pennsylvania, *Base for Ointments.*
Allen Leidig Werst, Pennsylvania, *Sulphur.*
William Wilcox, Pennsylvania, *Syrups.*
Theophilus Newton Willard, Pennsylvania, *Diffusibility of Powders.*
James Williamson, Illinois, *Pharmacopœia.*
Charles Wittig, Pennsylvania, *Malt Preparations.*
Otto Frank Zacherle, Pennsylvnia, *Unguentum Hydrargyri Nitratis..*
Joseph Philip Zoeller, Pennsylvania, *Glycerin and its Tests.*

The Examining Committee reported the following *senior* students as deserving of honorable mention with the general grade, "distinguished:" H. D. Diedrich, J. W. England, W. F. Jungkunz, W. W. Light, C. F. Randolph, W. E. Saunders, and F. J. Schmidt, and with the general grade "meritorious:" R. C. Browning, M. Campbell, J. P. Frey, O. B. Hannon, D. R. Jones, F. G. Kerr, L. C. Leonhard, and G. Scherling.

The same committee reported also the following *junior* students as deserving of honorable mention for the examination passed by them: H. W. Anderson, H. L. Barber, F. F. Bridgeman, W. F. Dohmen, M. E. Falck, W. H. Gano, Jr., C. H. Haentze, H. E. Heinitsh, W. M. Koenig, C. B. Lowe, T. McKenzie, H. C. C. Maisch, P. E. Meissner, C. H. Oberholtzer, W. Ogilby, H. P. Pettigrew, F. G. Ryan, and L. J. Schrœder.

In response to an invitation extended by the Professors, the members of the graduating class and of the Board of Trustees assembled in the museum hall of the College, on the evening of Thursday, March 15th, and sat down to a supper, which being over, brief addresses were made and the graduates presented to Professor Sadtler a very comfortable easy chair, and to the Actuary, Thos. S. Wiegand, a handsome bookcase.

The commencement exercises closing the sixty-second session of the Col-

lege took place at the Academy of Music, on the evening of Friday, March 16th, when the degree of Ph.G. was conferred upon the candidates by the President of the College, Dillwyn Parrish, and the Procter prize gold medal was awarded, on behalf of the Board of Trustees, by Vice-President Charles Bullock, to W. F. Jungkunz, of Freeport, Ill., and to Wm. E. Saunders, of London, Ont. The chemical prize (a Troemner analytical balance) for the best analytical work was awarded by Prof. Sadtler to J. P. Frey, of Union City, Ind., with honorable mention of J. H. M. Clinch, M. Wm. Coleman, C. F. G. Helm, Jr., and W. F. Jungkunz. The chairman of the Examining Committee, Wm. J. Jenks, presented the H. C. Lea prize, one hundred dollars, for the best thesis to J. W. England, with honorable mention of M. V. Cheatham, H. D. Dietrich, W. C. Franciscus, W. B. Gleim, W. W. Light, W. E. Saunders and R. J. Weber. The prize offered as the Prof. Maisch prize by Mr. J. H. Redsecker, of Lebanon, Pa., twenty dollars in gold, for the best examination of drugs by means of the microscope, was presented by the chairman of the Committee on Instruction, Chas. Bullock, to W. F. Jungkunz, with honorable mention of W. E. Saunders, J. P. Frey, W. W. Light, G. C. F. Helm, J. W. England, F. R. Eilinger, H. H. Deakyne and H. D. Dietrich.

The valedictory address was delivered by Professor Maisch, and the exercises closed with the distribution of flowers and other presents sent by the friends of the graduates.

THE ALUMNI ASSOCIATION OF THE PHILADELPHIA COLLEGE OF PHARMACY held its nineteenth annual meeting on Wednesday, March 14th, when the following officers were elected: President, Lucius E. Sayre; Vice Presidents, Chas. A. Weidemann and Jacob S. Beetem; Recording Secretary, Wm. E. Krewson (corner of Eighth street and Montgomery avenue); Corresponding Secretary, John A. Witmer (corner of Eleventh and Master streets); Treasurer, Edward C. Jones; Executive Board (for three years)—C. Carroll Meyer, Thomas H. Potts; Trustee of Sinking Fund, Thomas S. Wiegand; Orator for 1884, Robert Hays Vansant, class 1879.

During the past year 107 graduates had become active members of the association, which has now a membership of 750. Six members had died during the year, viz.: Simon Wolf, class 1882; B. Franklin Shugard, class 1868; Dr. Hiram Gold, class 1864; James A. Maston, class 1875; Pratt R. Hoagland, class 1868.

The Alumni reception to the graduating class was held in the Pharmacy lecture-room of the College on the evening of March 14th, the President, Thos. H. Potts, in the chair. The newly-elected members of the association received their certificates of membership, the President awarded the Alumni gold medal to Wm. F. Jungkunz, and certificates were presented to the following graduates, who had passed the best "very satisfactory" examinations in the branches named: Materia medica, C. F. G. Helm, Jr.; pharmacy, W. E. Saunders; chemistry, W. W. Light; general pharmacy, I. E. Leonhard; practical pharmacy, C. F. Randolph; also, certificate for the best junior examination to Wm. F. Dohmen, of Milwaukee.

The annual Alumni address was delivered by Louis Genois, Ph.G., and the valedictory address on behalf of the graduates by W. W. Light, of Oregon, Ill.

ZETA PHI ALPHA CHAPTER, P. C. P.—The annual meeting of the society was held Thursday, March 15th, in the society room in the College building. After the transaction of routine business, a number of new members were elected and duly initiated. The following officers will hold over or were elected for the ensuing year: Fellows—H. B. French, President; A. P. Brown, Wm. E. Krewson, Vice Presidents; C. W. Hancock, Treasurer; Wallace Procter, 900 Lombard street, Secretary; Chaplain, Rev. I. C. Craven; Executiue Council—Joseph L. Lemberger, Jas. A. Parker, Thos. H. Potts, Edward C. Jones, C. W. Warrington, C. J. Biddle, Wm. W. Moorhead, Prof. F. B. Power, Thomas L. Buckman.

THE NEW YORK COLLEGE OF PHARMACY held its fifty-third annual commencement in Steinway Hall on the evening of March 20. The President of the College, Ewen McIntyre, delivered an address, and then conferred the degree of Ph. G. upon the following candidates.

Clarence S. Abrams, Croton Falls, N. Y., *Oleoresins.*
Maximilian J. Averbeck, Marietta, Ohio, *Pill Making.*
Frederick U. Becker, Morristown, N. J., *Pepsinum Saccharatum.*
Charles Blauw, Rochester, N. Y., *Acetic Acid.*
Frank H. Boyd, Springfield, Ohio, *Fluid Extract Rhubarb.*
Alfred L. Browne, Cohoes, N. Y., *Ferri et Quininæ Citras.*
Gustav H. Bruning, New York, N. Y., *Fluid Extracts.*
Daniel H. Buell, Marietta, Ohio, *Syrupus Ferri Iodidi.*
William J. Burns, New York City, *Jaborandi.*
Joseph Colp, Southbridge, Mass., *Extractum Glycyrrhizae.*
Ansel G. Cook, Vineyard Haven, Mass., *Abstracts.*
Julius A. Dankel, New York City, *Salycilic Acid.*
George Dart, Poughkeepsie, N. Y., *Nicotiana Tabacum.*
Gustav A. Diedel, New York City, *Zinc and Officinal Preparations.*
Edward W. Dorr, Pittsfield, Mass., *Sodium Chloride.*
Louis A. Eberhardt, New York City, *Plant Life.*
August Reinh. Eschmann, Bückeberg, Germany, *Salicylic Acid.*
Henry Ettinger, Russia, *Emulsions.*
Walter G. Frey, Brooklyn, N. Y., *Testa Praeparata.*
William S Funnell, Huntington, N. Y., *Physician and Pharmacist.*
Edward G. Gerstle, New York City, *Chrysarobin.*
Oscar Goldman, Austin, Texas, *Phosphorus.*
John T. Crafton, Norwich, Conn., *Soap Bark.*
Phillip Grassmuck, Coburg, Germany, *Life and Construction of Plants.*
Alfred T. Halsted, Paterson, N. J., *Abstracts U. S. P.*
Willis N. Haverstick, Millersburg, Pa., *Boric Acid.*
Herman Heinemann, New York City, *Citric Acid.*
Joseph Hubachek, New York City, *Pepsin.*
Henry S. Johnston, Newton, L. I., *Iodum.*
Henry E. Klein, Charleston, S. C., *Medicinal Alkaloids.*
John Lewis Kopf, New York City, *Citric Acid.*
Charles C. Kraemer, Newark, N. J., *Phenol and Reactions.*
Joseph Kraft, New York City, *Aconitum Napellus.*
George Lamb, Columbiana, Ohio, *Glucose.*
Walter S. Lawall, Easton, Pa., *Unguentum Aquæ Rosae.*
Otto Leister, New York City, *Glycerin.*
Phillip P. Link, New York City, *Oxalic Acid.*
William G. Mangold, New York City, *Chloral Hydrate.*
Frank H. Manson, Port Chester, N. Y., *Petrolatum.*
Albert E. Marsland, Brooklyn, N. Y., *Tinct. Sanguinariae.*
Charles H. Mascher, Saxony, Germany, *Suppositoria.*
Theodor Miller, New York City, *Antimony and Preparations.*

George G. Needham, New York City, *Phytolacca Decandra.*
Charles J. Proben, Germany, *Bismuth and its Compounds.*
Joseph L. Putegnat, Jr., Brownsville, Texas, *Castila Micholsom.*
A. S. Rauschenberg, Atlanta, Ga., *Action of certain drugs on Mimosa Predica.*
A. E. Richmond, Geneva, Ohio, *Analogies of the Haloids.*
Louis F. Roediger, New York City, *Estimation of Iron in Elixirs.*
Charles F. Runkel, New York City, *Syrup of Tolu.*
Henry Savage, Brooklyn, N. Y., *Cinchona and its Alkaloids.*
William F. Shields, Hackettstown, N. J., *Iodide of Potassium.*
William A. Speck, Haverstraw, N. Y., *Chlorine.*
John Spillane, Cohoes, N. Y., *Emulsions.*
Alfred Stover, Dover, Del., *Action of Opium.*
John Wackerbath, New Rochelle, N. Y., *Digitalis.*
J. C. Warsaw, New York City, *Glycerin.*
John H. Weil, Brooklyn, N. Y., *Sanguinaria.*
Phillip Westermann, London, England, *Guarana.*
Robert G. Westermayer, Ratisbon, Bavaria, *Absinthium.*
Frank H. Zitz, New York City, *Tobacco.*

CHEMISTRY AND MATERIA MEDICA ONLY.

William T. Bower, Williamsburg, N. Y.
Edward M. Butler, Brooklyn, N. Y.
C. B. Grimshaw, Brooklyn, N. Y.
Henry H. Lloyd, England.
Arthur H. Stiles, Chicopee Falls, Mass.

The President of the Alumni Association, George Inness, awarded several prizes to meritorious students, of whose names we have not been informed. The valedictory address on behalf of the graduating class was delivered by Alfred Stover, followed by an address from Rev. Dr. J. P. Newman, and closing with the distribution of presents and with music.

ALUMNI ASSOCIATION OF THE NEW YORK COLLEGE OF PHARMACY.—At the annual meeting held March 16th, the following officers were elected for the ensuing year: President, George Inness; Vice Presidents—C. F. Habner, A. G. Cook, B. F. Hays; Treasurer, L. M. Royce; Secretary, Fred. Hohenthal; Registrar, John Oehler; Executive Board—R. G. Weyh, for one year; J. L. A. Creuse and H. Schmid for three years.

The exhibition of crude drugs, chemicals, pharmaceutical appliances, and rare works and books appertaining to chemistry and pharmacy was highly successful, and was appreciated by all.

KINGS COUNTY PHARMACEUTICAL SOCIETY.—The annual meeting was held February 6th, and the annual reports show a prosperous condition of the Society's affairs. The following officers were elected for the ensuing year: President, Robert Black; Vice Presidents—L. D. Sheets and J. MacDonald; Secretary and Treasurer, C. K. Paddock; Assistant Secretary, J. L. A. Creuse; Board of Censors—L. T. Perkins, E. A. Sayre, and G. Ramsperger; Board of Trustees—Thos. D. McElhenie, G. M. Baker, L. E. Nicot, W. P. DeForest, and G. P. Tapling.

THE ALBANY COLLEGE OF PHARMACY held its second commencement exercises on Tuesday evening, February 27th. An address was made by the President of the Faculty, Prof. Jacob S. Mosher, M. D., after which the

degrees were conferred by the President of Union University, Rev. E. N. Potter, D. D., upon the following graduates:

Lyle E. Ackerman, Sarah E. Simonet, George Boucher,
Frank J. Smith, Theodore J. Lewi, Leonard H. Wheeler,
Louis Sautter, Jr. Theodore C. Yauman.

The following have completed the course, but their diplomas are withheld until their period of apprenticeship shall have expired: Thaddeus N. Benjamin, and John C. Roth.

Then followed an address to the graduates by Alfred B. Huested, M. D., President N. Y. State Parmaceutical Association, the valedictory on behalf of the class by Louis Sautter, Jr., and the presentation of prizes by the President of the Trustees, J. W. Russell.

MARYLAND COLLEGE OF PHARMACY.—The thirty-first annual commencement took place in Baltimore, at the Academy of Music, on Friday, March 16th, when the degree of Ph. G. was conferred by the President, Dr. Jos. Roberts, upon the following graduates:

E. H. Atkison, Delaware, *Metric System.*
A. Parran Betts, Maryland, *Cypripedium.*
Louis Baist, Germany, *Chromium.*
Guy H. Boyd, Pennsylvania, *Iodoform.*
Henry Becker, Maryland, *Solutions.*
Joseph Blum, Maryland, *Succinic Acid and its Compounds.*
Luther B. Benton, Maryland, *Aconitum Napellus.*
Alston H. Bickers, Virginia, *Opium.*
Wm. L. Campbell, Maryland, *Bromine.*
Martin A. Daily, Maryland, *Ethers.*
W. F. Dailey, Mississippi, *Ferrum.*
Chas. H. Elliot, Maryland, *Percolation.*
Wm. C. Fink, Maryland, *Chemistry.*
Manes E. Fuld, Maryland, *Carbon.*
S. M. Gable, Pennsylvania, *Ferrum.*
Thos. D. Hursey, West Virginia, *Prinos Verticillatus.*
William Krauss, Tennessee, *Phosphorus.*
J. Beauregard Kelley, Virginia, *Emulsions.*
Emile Lautenbach, Maryland, *Hydrogen.*
Wm. F. Markert, Maryland, *Hydrarg. Iod. Virid.*
Henry Maisch, Maryland, *Arnica.*
Chas. D. Remsburg, Maryland, *Percolation and its Process.*
Noble C. Rolph, Maryland, *Opium.*
W. A. Sites, Maryland, *Cytisus Scoparius.*
A. Edwin Schmidt, Maryland, *Scuttellaria Lateriflora.*
G. E. M. Smith, Maryland, *Iodine.*
Geo. A. Thompson, Maryland, *Bromine.*
A. M. Tumbleson, Maryland, *Hydrargyrum.*
J. J. Valentini, Maryland, *Chemistry.*
Chas. H. Wissler, Maryland, *Strychnos Nux Vomica.*
J. Wesley White, Maryland, *Hydrargyrum.*

The prizes from the College were awarded to William Krauss, gold medal; to A. Edwin Schmidt, Webster's Unabridged Dictionary, and Hoffmann and Power's Chemical Analysis; to J. J. Valentini, National Dispensatory and Hoffmann and Power's Chemical Analysis; and in the Junior class to R. M. Glacken, U. S. Dispensatory. The recipient of the Simon prize, consisting of a gold medal, was J. J. Valentini.

The Junior class students entitled to honorable mention, are R. M. Glacken, Louis Bellerman, W. F. Sulzbacher, A. J. Lacier, C. P. Straus, and F. W. Sultan.

The valedictory address was delivered by Rev. Chas. S. Albert.

ST. LOUIS COLLEGE OF PHARMACY.—The seventeenth annual commencement took place at Liederkranz Hall on Wednesday, March 14th, 1883, in the presence of a large audience. After several airs of music, the President, F. W. Sennewald, in a few appropriate words, conferred the degree of Graduate in Pharmacy upon the following candidatse:

Arthur C. Bang,	Chas. C. Girsick,	Thomas L. Reber,
Edward H. Barnichol,	Geo. B. Haase,	Chas. F. Ruesch,
Wm. M. Benz,	Gust. A. Hartnagel,	Oscar J. Reuss,
Henry J. Bergmann,	Anton P. Hess,	Oscar Ruff,
Chas. C. Borchers,	Frank S. Jüngling,	Herman Saxenmeyer,
Henry Brookes,	Chas. H. Koeneke,	Wm. C. Schott,
Wm. F. Carter,	Hugo W. Kohler,	Edward B. Schuh,
Henry C. Duering,	Jean B. Knopf,	R. N. Schweickhardt,
Wm. S. Duncan,	Wm. H. Lancey,	Ferd. C. Sennewald,
Jno. A. W. Fernow,	Augustus Leonhart,	Herman G. Smith,
Marshal Finch,	Geo. A. Luecking,	G. Wm. Steininger,
Edw. H. Fielingsdorf,	Fred. A. Moses,	Henry G. Tubbesing,
Jacob Friess,	Fred. J. Motz,	Albert F. Wellmeyer,
Wm. H. Gallenkamp,	Rudolph A. Raible,	Henry M. Whelpley.

The following students of the Senior class received honorable mention for passing very creditable examinations: Wm. S. Duncan, Chas. C. Borchers, Henry J. Bergmann, A. P. Hess, Oscar Ruff, Augustus Leonhart, Chas. F. Ruesch, Wm. C. Schott, and Geo. A. Luecking. The following students of the Junior class received honorable mention: F. W. Schumacher, Henry Huetze, R. H. Smiley, Otis W. Smith, J. C. Falk, Francis Zerr, A. Horany, and J. A. Turner. The following received certificates of proficiency in Chemistry: Rudolf Hauser and John G. Lumolius. The valedictory on the part of the faculty was delivered by Prof. C. M. Woodward, of Washington University. Mr. Henry S. Brookes answered on the part of the graduates, in well chosen words. Prof. C. O. Curtman delivered the Alumni medal to Mr. Henry M. Whelpley, who obtained the highest average in all branches.

This closed the exercises, and then followed a social reunion, which was enjoyed by all present.

THE ALUMNI ASSOCIATION OF THE ST. LOUIS COLLEGE OF PHARMACY held its annual meeting at the College rooms, February 21st, when the President delivered an address, commenting on the success of the society during the past year. The reports of the different committees and officers were read, that of the treasurer showing a handsome cash balance on hand.

The following officers were elected for the ensuing year: President, J. W. Tomfohrde; Vice Presidents, E. R. Martin and Theo. Klipstein; Recording Secretary, Theo. C. Loehr; Corresponding Secretary, Thos. A. Buckland, Jr.; Treasurer, Charles Gietner; Executive Board (for three years), O. F. Heitmeyer and J. P. Schoenthaler.

CALIFORNIA PHARMACEUTICAL SOCIETY AND COLLEGE OF PHARMACY.—At the annual meeting, held January 11th, the following officers were elected for the ensuing year: President, Emlen Painter; Vice Presidents—F. C. Keil, E. W. Runyon; Corresponding and Recording Secretary, Fred. Grazer; Treasurer, E. A. Schreck; Librarian and Curator, E. Happersberger; Editor, John Calvert; Trustees—Emlen Painter, John Calvert, S. A. McDonnell, Fred. Grazer, D. W. Kirkland, John Dawson, Fred. C. Keil.

The various officers handed in their annual reports, which were approved and placed on file. Mention was made of the new College and Society building, now in the course of construction, estimating its cost and furnishing at $6,000. On account of the death of Mr. Phrank L. Vreeland, one of the officers and members, the meeting was adjourned until Thursday, January 25th, when several amendments to the by-laws were adopted, and a number of papers on pharmaceutical subjects were read and have since been printed in the "Proceedings."

The new building, which was expected to be finished at the beginning of the lecture course, April 3d, is situated on Fulton street, between Polk and Van Ness avenue. It is 30 x 80 feet in size, three stories high in front and two in the rear. The ground floor has one room for museum and library and another for the professors; back of these is the lecture hall, 30 x 45 feet. Over the lecture hall is the laboratory, of the same size, but which will not be equipped at present. On the same floor are three rooms designed for the the use of the Adelphi Society (an association of the students), for meetings of committees and for other purposes. The third story consists of a small dwelling of five rooms, where it is intended the janitor shall reside. The subscriptions to the building fund amounted to about $4,000 last January.

We congratulate the pioneer College of Pharmacy on the Pacific Coast to the enlarged field of usefulness which is doubtless in store for it and can be better cultivated now that it has secured a permanent "home."

KENTUCKY PHARMACEUTICAL ASSOCIATION.—Owing to the removal of Mr. E. S. Porter from Eminence, the Executive Committee has changed the place of meeting to Lexington, where it will be held May 15th, and has appointed Mr. J. B. Wood, Acting Local Secretary.

EDITORIAL DEPARTMENT.

MICROSCOPICAL EXAMINATION OF DRUGS.—Through the liberality of Mr. J. H. Redsecker, of Lebanon, Pa., there was offered to the last senior class of the Philadelphia College of Pharmacy, and has likewise been offered to the next class a prize of $20, in the department of Materia Medica, which prize according to the recommendation of the Committee on Instruction, approved by the Board of Trustees, was to be, and will be, competed for in the following manner: The candidates for graduation attaining the grade very satisfactory in the examination of materia medica specimens and questions, are to examine ten sections of drugs, the prize to be awarded to the one determining the largest number correctly; if necessary,

a second and third examination of such sections is to be made by those recognizing the largest number of the first set.

At the recent examination the competitors were nine in number, and on this, the first occasion, it was deemed advisable to prepare several sections of drugs in such a manner that the microscope was not absolutely necessary for their identification, while the largest number consisted of sections especially prepared for the microscope, the cell-contents being removed so that only the structure was visible. The sections selected were of the first-class calumba, cocculus indicus, nux vomica and pumpkin seed, and of the second class, sarsaparilla, taraxacum, veratrum, flat Calisaya bark, clove and conium fruit. One of the competitors determined 9, one 8, two 7, one 6, three 5, and one 3 of the specimens, the two highest being the same students, who without considering this special examination, were awarded the Procter prize. One of the specimens was not identified, a result which is easily understood by those who are familiar with the microscopic appearance of the transverse and longitudinal sections of the calyx tube of caryophyllus, resembling, as they do, a number of rhizomes and roots containing oil cells in the bark. The results of this examination were, therefore, highly satisfactory, the more so as only a very small proportion of these students had previously received instructions in the use of the microscope.

That the microscope is not as frequently used in pharmacy as it deserves to be, is due to a variety of causes, prominent among which is the want of opportunity and for instruction in the application of that instrument for the needs of the pharmacist. The Alumni Association of the Philadelphia College of Pharmacy has, during the past winter, endeavored to supply this want by organizing a class under the direction of A. P. Brown, Ph.G., who is an experienced microscopist. Although only a limited number of students embraced the advantages thus offered, yet the zeal shown was so encouraging that a spring class will be formed early in April, when instructions will be given in the various microscopical manipulations, in drawing with the camera lucida, in urinary analysis, in section cutting, double staining, mounting, finishing of slides, photomicrography, detection of adulterations, etc. A number of Zentmayer's microscopes have been procured for the purpose, and all necessary arrangements have been made to make the instruction as practical as possible.

On this subject, concerning the use of the microscope in the examination of drugs, we have received a communication from Mr. H. M. Wilder, which we publish in full.

"Professor P. D. Penhallow (Cambridge) has written a small guide for the use of beginners in vegetable histology, consisting of a series of tables giving the action of reagents upon cell-contents, cellulose forms, and plant products, and preceded by short paragraphs upon the special uses of the different reagents and the behavior of vegetable products. This book, or rather pamphlet of forty pages, has been published in first-class style, by S. E. Cassino, Boston, (printed on heavy paper, 9½ inches by 6 inches, with a very generous margin (1½ inches and 2 inches), has nine blank leaves, and is exceedingly well bound; in view of the "getting up" the price of one dollar is not too much. This is, however, only a rudimentary guide, suitable for beginners, the most complete work on the subject is "Botanisk Mikrokemi," by V. A. Poulsen, Copenhagen 1880, 8vo. (Danish), which has since been translated into German, and, as I see from late French journals,

also into French. It treats of all the reagents which up to date have been proposed, 46 pages, then of the behavior of the different plant products, 22 pages, and is preceded by an exhaustive list of over one hundred books, pamphlets and articles bearing on the subject."

"This reminds me that as yet, we have not a single hand-book or treatise on practical microscopy as applied to the requirements of pharmacy, neither in the English, French, nor German languages. All that we possess is a short pamphlet of 34 pages, by Prof. Mark W. Harrington, Ann Arbor, *on the identification and microscopical examination of crude drugs, etc.;* and a series of very thorough articles on the microscopical examination of single drugs, by Hy. Pocklington, which appeared in the London "Pharmaceutical Journal and Transactions for 1872, '73 and '74." What we want is a manual of microscopical manipulation, not a mere outline (such we have), but which goes very much in detail and not only takes up drugs by classes (roots, barks, leaves, etc.,) but shows with every drug separately how to treat it previous to section-cutting, and how to apply reagents to differentiate in the best way the structure, etc. Prof. Harrington has completed a more extended work than his pamphlet, which covers much of the ground here proposed, but it still exists only as manuscript, and will very likely remain in his desk for a long time. Plenty of stray notices will be found in Berg, Schacht, Wigand, Sachs, Vogl, Nägeli, Dippel, Hager, Flückiger, Planchon, and others, not to mention treatises on the use of the microscope in medicine nor the various microscopical journals and articles, but in order to get at them we have to take so many things into the bargain which we do not feel much interested in.

I should think that Mr. E. B. Stuart, Chicago, or Mrs. Louisa Reed Stowell, Ann Arbor (Mich.), would be eminently fitted for writing such a manual.

H. M. WILDER."

NATIONAL RETAIL DRUGGISTS' ASSOCIATION.—The organization of such an association is contemplated, as will be seen from the annexed circular, which has just been issued, and which also explains the objects sought to be attained:

The time seeming propitious, and the state of trade demanding it, we, the undersigned, deem it wise to issue a call for a convention to meet in Washington, D. C., Monday, Sept. 10, 1883 (being the day previous to the meeting of the American Pharmaceutical Association), for the purpose of organizing a National Trade Association of Retail Druggists. The object of this Association will be to discuss and take action upon the many and growing evils that affect the retail trade. Among others may be specified, relief from ruinous competition in proprietary articles and its antidote the retail rebate plan; relief from burdensome and unjust taxation; the preventing of our business being diverted into the hands of grocers and dry goods dealers, questions of vital importance.

If this organization shall receive the hearty and generous support of the twenty-five thousand retail druggists in the country it cannot fail to be of the greatest benefit to each and every one, the mere fact of obtaining protection in obtaining marked prices on proprietary articles appealing to all, and if construed as representing the sentiments of the retailers collectively, must of necessity wield a vast influence.

It is not intended that this Association shall at all interfere with the American Pharmaceutical Association, whose functions are almost exclusively scientific, but to work entirely in harmony with it. The time and place designated have been selected in view of the fact that it was desirable in many instances that the same delegates might represent State and local associations in both the American and the one in question. State, county and local associations are earnestly requested to send delegates as follows:

State, 5; county, three; and local 2 each; while an invitation generally is extended to all retail druggists who can, to be present and unite with us in this important move, whose benefits are to be equally shared by all. Those who are unable to be present are requested to forward their names for membership. Knowing the many expenses we are called upon to meet, the assessments will be made very light. At the annual meeting of the Connecticut Pharmaceutical Association, held in Hartford, Feb. 7, 1883, this object was unanimously endorsed and the president was instructed to appoint delegates. It has also received the endorsement of various county and local associations. It is earnestly desired that as many responses to this call be received from different sections of the country as possible, in order that some idea may be formed as to whether such an organization is desirable or not.

Retail druggists in sympathy with the objects specified in this circular, those desiring information, and those intending to become members of the proposed Association, are requested to confer with J. W. Colcord, Secretary Massachusetts State Pharmaceutical Association, Lynn, Mass.

March 22, 1883.

This call is signed by the presidents of 23 State Pharmaceutical Associations, namely, of Ababama, California, Connecticut, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Massachusetts, Missouri, Nebraska, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Texas, Vermont, Virginia, West Virginia and Wisconsin; also by the president and treasurer and three members of Council of the American Pharmaceutical Association.

The State Associations by whose presidents the project has been endorsed, embrace, we believe, with two exceptions all of these bodies at present in existence, the pharmaceutical associations formerly active in four or five other States not having held any meetings for a number of years. The unanimity which is thus seen to prevail, is of itself proof of the necessity of such an organization, and of the good which it may accomplish; and the time chosen for the convention must insure for it the large attendance which the movement deserves.

A MEMORIAL TO FREDERICK WOEHLER is contemplated, and the Board of Directors of the German Chemical Society, which has its headquarters in Berlin, under date of January 30th, has issued a call to all reverers and admirers of this deceased chemist, for contributions towards this purpose, which may be sent to the Treasurer of that Society, Mr. J. F. Holtz, in Berlin, or to Dr. Pauer, Secretary of the University of Göttingen. It is stated that the call for contributions towards monuments to Justus Liebig had been liberally responded to, and that the statue intended for Munich would be ready for unveiling in a few months. A similar liberality is expected from the pupils and the chemists in general towards perpetuating the memory of Liebig's distinguished co-worker, Woehler.

INTERNATIONAL PHARMACEUTICAL EXHIBITION.—To the various international exhibitions of special industries which are to take place in different countries during the next year or two, there is to be added an international *pharmaceutical* exhibition, which will be held in Vienna, Austria, upon the premises of the Horticultural Society, commencing August 11th and closing August 27th next. The different Austrian phar-

maceutical societies have appointed an Executive Committee, of which A. von Waldheim is President, Dr. A. P. Hellmann, Vice-President, and Dr. Hans Heger (ix, Berggasse 22) and Ferdinand Kwisda, Secretaries.

The articles designed for exhibition must belong to one of the following five groups: 1. Scientific instruments and accessories applicable for pharmaceutical purposes. 2. Literary productions belonging to the domain of pharmacy or its collateral sciences. 3. Apparatus and machines for the preparation of medicinal products. 4. All fixtures and utensils necessary for or applicable in conducting the apothecary business. 5. Drugs, chemical products, pharmaceutical preparations and goods in general intended for medical use. *Excluded* are the following: Medicinal specialties, the composition and mode of preparation of which are not based upon acknowledged rational, scientific principles, and all secret remedies without distinction, whether their composition be known or not. The prizes will consist of an honorary diploma, diploma of the golden medal and diploma of the silver medal.

The charges for space will be for the square meter or running meter or a fraction thereof, 10 florins; free space, per square meter, 20 florins; wall room for flat objects, per meter, 5 florins; a reduction will be made for 10 or more square meters. The goods must arrive in Vienna on or before August 6, and must be removed from the building by August 31. Alcohol, ethers, oils, essences and other very inflammable articles must be exhibited in suitable vessels of limited dimensions. Insurance against fire and other accidents will be at the risk of the exhibitors.

Applications are required to be made not later than April 30th, a date which gives to American firms who may contemplate to exhibit their goods very little time for consideration, since the circular was issued under date of March 8th, and did not reach this country until near the end of the month.

CORRECTION.—In Prof. Armstrong's paper on Turpentine, published in our March number, on page 147, the author speaks of Mr. Charles Rice as the American editor of "Pharmacographia." Dr. Rice informs us that he has never used this title, and is not entitled to it.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Year-Book of Pharmacy, 1881–1882, with the Transactions of the British Pharmaceutical Conference at the Nineteenth Annual Meeting, held at Southampton, August, 1882. London: J. & A. Churchill 8vo. pp. 550. Price, 10 shillings.

Proceedings of the American Pharmaceutical Association at the Thirtieth Annual Meeting, held at Niagara Falls. N. Y., September, 1882. Philadelphia: Sherman & Co., Printers, 1883. 8vo, pp. 757. Price, $6.50.

The first of the above annual publications was issued about two months ago, while the latter will be ready for distribution early in April. We have on former occasions repeatedly discussed the contents of these publications and the arrangement of the subject-matter, so that it would seem to be

sufficient now to merely state that, as repositories of the scientific and practical pharmaceutical literature during the preceding year, they are fully equal to their predecessors, sustaining the reputation which they have acquired in the past, and that they should have a place in the library of every pharmacist. A new feature has been introduced by Professor Diehl in his classified report on the Progress of Pharmacy, which will be appreciated by those who consult it, namely, the introduction of cross references to subjects treated of under a different heading. It deserves to be mentioned yet that the "Proceedings" are embellished with the portrait of the first First Vice-President of the Association, the late George W. Andrews, of Baltimore.

Lehrbuch der Pharmaceutischen Chemie. Von Dr. Hugo Schwanert, ordentl. Professor der Chemie an der Universität zu Greifswald. In drei Bänden. Zweiter Band. Mit 25 Holzschnitt-Illustrationen. Braunschweig: C. A. Schwetschke und Sohn, 1883. 8vo, pp. 815.

Pharmaceutical Chemistry, in three volumes. Vol. II., with 25 wood cuts.

It is just three years when we noticed the publication of the first volume of this work (see Amer. Jour. Phar., April, 1880, p. 236). In commenting upon it then we pointed out the aims and objects which the author had evidently in view in writing his valuable work, and which may be summarized in this to furnish a practical and reliable guide for synthetical, and, incidentally, also for analytical chemical work in its special application to medicinal and otherwise important compounds. These views have guided the author likewise in the volume now before us, which embraces the metallic elements and their compounds.

After a brief historical exposition of the nature and general characters of the metals, they are classified in the following groups: 1. Metals of the alkalies, K, Na, Li, Rb, Cs. 2. Metals of the alkaline earths, Ba, Sr, Ca. 3. Metals of the earths, Al, Be, In, G, Y, Er, La, Ce, Di. 4. Metals proper: (*a*) magnesium group, Mg, Zn, Cd; (*b*) lead group, Pb, Tl; (*c*) silver group, Ag, Hg, Cu; (*d*) bismuth group, Bi, V, Ta, Nb; (*e*) tin group, Sn, Zr, Ti, Th; (*f*) iron group, Fe, Mn, Ni, Co; (*g*) chromium group, Cr, Wo, Mo, Ur; (*h*) gold group, Au, Pt, Pd, Ru, Rh, Ir, Os. Each group is characterized, their behavior to heat and oxygen, and the nature of their oxygen compounds furnishing the chief particulars for comparison.

In treating of the metals only those have been selected of which one or more compounds are used in pharmacy or medicine, or in chemical analysis. The poisonous nature of thallium ascertained by Marmé, Lamy, and others, and the occurrence of this metal in a few mineral springs, or salts obtained from them, have secured for it a place among the more strictly medicinal metals, and the same distinction has been accorded to strontium, which is frequently present in minute quantities in natural mineral waters.

Of the various compounds of these metals, those with oxygen, sulphur, and the halogens are in all cases considered more or less in detail as their importance seemed to demand, while the oxysalts are as a rule confined to those which are of some importance within the limits defined above; thus the phosphates of potassium, zinc, and a few similar salts have been omitted,

although they have been somewhat employed in medicine. The ammonium compounds are appended to those of the alkaline metals, and the cyanides are described among the halogen compounds. The processes by which the different metals and their compounds may be obtained, merely experimentally as well as on the larger scale, are fully described and explained, the reactions being further elucidated by formulas and equations. The tests of identity are given, the differences of the reaction of allied bodies are described, and the nature of impurities and the mode of their detection are pointed out. Historical notes are frequently met with, and are not only interesting, but often very useful, like those which give the various views entertained in regard to the exact composition of some of the compounds.

Throughout the entire volume its usefulness for practical purposes on the one hand, and for theoretical instruction on the other hand, is quite apparent, and its inherent value has been clothed in a very appropriate garb—the typographical execution, the illustrations, and the paper, leaving nothing to desire. A full index for the first and second volume is quite a desirable addition.

The third volume, containing the organic compounds, will complete the work.

An Introduction into the Study of Organic Chemistry. By Adolph Pinner, Ph. D., Professor of Chemistry in the University of Berlin. Translated and revised from the fifth German edition, by Peter T. Austen, Ph. D., F. C. S., Professor of Analytical and Applied Chemistry in Rutger's College and the New Jersey State Scientific School. New York: John Wiley & Sons, 1883. 12mo, pp. 403. Price $2.50.

The plan of this work, which has been very favorably received in Germany, is based upon the system adopted by Prof. A. W. Hofmann for teaching theoretical chemistry of the carbon compounds. Its object is, as far as possible in our present state of knowledge, the evolution of the more or less complicated compounds from the most simple ones in existence, and in this gradual progression, from the simple to the complicated, lies its intrinsic value and usefulness for theoretical study. That the plan has its disadvantages cannot be denied since it renders impossible the consecutive consideration of analogous compounds like the alcohols, ethers, aldehyds, acids, etc., a grouping adopted by many teachers, having likewise obvious advantages, but representing a system which in inorganic chemistry has long since been abandoned by the large majority of teachers.

The work opens with an introductory chapter on general considerations concerning organic compounds, and proceeds then to the compounds belonging to and derived from the hydrocarbons of the marshgas group, methane being first described with the substitution and addition compounds generated by the halogens, by hydroxyl, by sulphur and sulpho-compounds, nitrogen and nitrogen groups, phosphorus, arsenic, antimony, bismuth, and other metals. In the same order the ethane compounds are considered together with ethylene and acetylene; then follow propane, butane, pentane, and hexane, with their allied and isomeric hydrocarbons and derivatives. The higher hydrocarbons of the marshgas group are not specially

described, but their derivatives are considered together as fatty acids, fats, and carbohydrates, and these are followed by uric acid and its derivatives, including several animal and vegetable compounds like xanthine, sarcine, theobromine, etc. This part of the work closes with a retrospect for the consideration of the general characters of the analogous compounds derived from the different hydrocarbons, such as aldehyds, ketones, esters, amine bases, etc.

The second part of the work is devoted to the aromatic compounds, which in a manner similar to that sketched before are evolved from the hydrocarbons, benzene, toluene, xylene, cumene, and cymene, followed by the compounds produced through the reduction of benzene derivatives, by the indigo group and a few condensation compounds, and finally by a retrospect.

The remaining portion of the work treats of naphthalene, anthracene, chrysene with allied hydrocarbons and derivatives, and a number of natural compounds nearly all of undetermined constitution, namely, camphor, essential oils, resins, pyridine bases; the latter being considered in this place owing to their close relation to the alkaloids which follow next, then the glucosides, coloring matters, bitter principles, biliary substances and protein compounds. An appendix gives instructions in the estimation of the elements of organic compounds, the determination of vapor density and of the constitution of organic compounds, in condensation, polymerization, atomic migration, etc.

It will be observed from the foregoing that the plan of the work has been well matured and consistently carried out. Being intended for a text-book, and not as a work of reference, the details which are expected to be found in the latter are necessarily absent; in fact it represents, in a thoroughly systematic manner, the framework of the science of chemistry confined to the carbon compounds, and as such must be a most valuable guide to the student who is anxious to obtain more than a superficial knowledge of this branch. The translation has been creditably done, and the proof-sheets have been well read, only few typographical errors having been noticed by us; a copious index, covering 20 pages, facilitates the use of the work.

Annual Address delivered before the American Academy of Medicine, at Philadelphia, October 26, 1882, by Traill Green, A.M., M.D., President of the Academy.

The address is devoted to the necessity and advantages of a thorough education as a prerequisite to the study of medicine and other sciences.

Transactions of the Medical Society of the State of Pennsylvania at its Thirty-third Annual Session, held at Titusville, May 10, 11 and 12, 1882. Volume XIV. Published by the Society. 8vo, pp. 467.

Twenty-third Annual Report of the German Hospital of the City of Philadelphia for 1882. Pp. 50.

Thirtieth Annual Report of the Pennsylvania Training School for Feeble-minded Children, Elwyn, Delaware county, Pa. Pp. 22.

Fifth Biennial Report of the Trustees, Superintendent and Treasurer of the Illinois Southern Hospital for the Insane, at Anna. Pp. 53.